Annual Report
on the
ENVIRONMENT
2002

Fairfax County, Virginia

Environmental Quality Advisory Council

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ENVIRONMENT

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Fairfax County, Virginia

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Printed on recycled paper

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INTRODUCTION

This year's Annual Report on the Environment has been prepared entirely by the Environmental Quality Advisory Council (EQAC). Staff support for the coordination and printing of the Report has been provided by the Planning Division of the Department of Planning and Zoning.

The Annual Report on the Environment, which is an update on the state of the County's environment, serves a threefold purpose. Initially, it is intended to assist the Board of Supervisors in evaluating ongoing environmental programs and to provide the basis for proposing new programs. The document also aids public agencies in coordinating programs to jointly address environmental issues. In addition, the report is directed to citizens who are concerned with environmental issues.

The Report contains chapters on major environmental topics including: water resources; air quality; ecological resources; wildlife management; solid waste; hazardous materials; noise, light, and visual pollution; and land use and transportation. Within each chapter are: a discussion of environmental issues; a summary of relevant data; and a discussion of applicable government programs. Where relevant, discussions of legislative issues are provided. Each chapter concludes with recommendations that identify additional actions that EQAC believes are necessary to address environmental issues.

This report covers activities affecting the environment in 2001; however, in some cases, activities from early 2002 are also included.

While the Environmental Quality Advisory Council has prepared and is responsible for this Report, contributions were made by numerous organizations. Many of the summaries provided within this report were taken verbatim from materials provided by these organizations. EQAC therefore extends its appreciation to the following organizations:

Audubon Naturalist Society
Clean Fairfax Council, Inc.
Coalition for Smarter Growth
Fairfax County Deer Management Committee
Fairfax County Department of Health
Fairfax County Department of Systems Management for Human Services
Fairfax County Department of Planning and Zoning
Fairfax County Department of Public Works and Environmental Services
Fairfax County Environmental Coordinator
Fairfax County Fire and Rescue Department
Fairfax County Park Authority
Fairfax County Police Department, Division of Animal Control
Fairfax County Sheriff's Office
Fairfax County Water Authority
Fairfax Joint Local Emergency Planning Committee
Federal Aviation Administration
George Mason University, Departments of Biology and Environmental Science and Policy
Humane Society of the United States
Illuminating Engineering Society of North America
International Dark-Sky Association
Interstate Commission on the Potomac River Basin
Lake Barcroft Watershed Improvement District

Metropolitan Washington Airports Authority (MWAA)
Metropolitan Washington Council of Governments (COG)
National Electrical Manufacturers Association
Northern Virginia Conservation Trust
Northern Virginia Regional Commission
Northern Virginia Regional Park Authority
Northern Virginia Soil and Water Conservation District
Occoquan Watershed Monitoring Laboratory
Reston Association
Transportation Coordinating Council of Northern Virginia
United States Fish and Wildlife Service
United States Geological Survey
Upper Occoquan Sewage Authority
Virginia Department of Conservation and Recreation
Virginia Department of Forestry
Virginia Department of Game and Inland Fisheries
Virginia Department of Environmental Quality
Virginia Department of Transportation
Virginia Outdoor Lighting Taskforce

In addition, EQAC wishes to acknowledge the efforts of the County's interagency Environmental Coordinating Committee, which coordinated the staff responses to the recommendations within EQAC's 2001 *Annual Report on the Environment*.

FAIRFAX
COUNTY

V I R G I N I A

Board of Supervisors
County of Fairfax
12000 Government Center Parkway
Fairfax, VA 22035

Madam Chairman and Members of the Board:

EQAC is pleased to present the 2002 Annual Report on the Environment. In this report, we discuss various environmental issues in Fairfax County. We do this in eight chapters – each chapter addressing a different aspect of the environment. Also in each chapter are EQAC's recommendations as to what actions Fairfax County should take to resolve identified problems.

In the past several years, EQAC has emphasized two of its recommendations as top priority recommendations. The first was to develop and implement a Countywide Natural Resource Management Plan. The second dealt with the County's streams. We recommended that the County create a Countywide Stream Protection Plan. Thanks to your direction and hard County Staff work, progress has been made in both areas. More needs to be done in these areas, and we do continue these recommendations in this Annual Report. However, this year EQAC is emphasizing different recommendations as being of top priority.

EQAC's top priority recommendations from the 2002 Annual Report on the Environment are the four interrelated recommendations on air quality. These are a continuation of recommendations from the last two years; however, no significant action has occurred with respect to these recommendations. A major problem has been lack of staff resources. Unfortunately, EQAC doesn't see any alternative but to increase staff resources in this area. The Metropolitan Region and Fairfax County need to come into compliance with Federal air quality standards – standards that we do not meet at present. Without such action, the County faces the serious financial consequences of loss of Federal transportation funding and the many other adverse economic and health impacts associated with air quality that does not meet federal standards. EQAC urges the Board of Supervisors in the strongest possible terms to take a proactive role in the area of air quality.

The last of these four recommendations states: ***As a means of focusing attention on the decisions that are necessary, EQAC recommends that the County set a deadline of June 30, 2003 for the adoption of a new Air Quality Attainment Strategy – a public document adopted by the Board that sets out the policies and priorities that Fairfax County intends to pursue both within the County and through the COG to ensure the achievement of the necessary levels of air quality with a reasonable margin of safety.***

EQAC notes the success of your actions in regard to stream valley protection. In the last few years, you adopted a change to the Policy Plan stating that it was a County policy to protect and

restore the ecological integrity of County streams. The County has published a highly successful Stream Protection Strategy report with broad stream restoration and preservation recommendations. The Stream Protection Strategy is continuing. The County is in the process of formulating watershed master plans under the Watershed Management Initiative and is mapping perennial streams. This is a drastic change from where the County was in regard to water quality several years ago. EQAC now urges you give the same attention to air quality.

Each chapter of this year's Annual Report contains the remainder of our suggestions. We urge your consideration and action on each of these.

This report covers 2001, but also includes significant actions from 2002 that could impact EQAC's comments and recommendations. Unfortunately, the report cannot capture all ongoing actions or the report would never be finished.

As we have done in the past, we would like to commend the outstanding efforts of some groups whose actions enhance the environmental quality in Fairfax County. The Northern Virginia Soil and Water Conservation District (NVSWCD) continues to make their efforts felt in many environmental areas – both as teachers and doers. The Northern Virginia Conservation Trust (NVCT) is pursuing and successfully obtaining easements on privately owned environmentally sensitive land. (NVCT's efforts have been enhanced thanks to the public-private partnership with them that you created in 2001.) Fairfax ReLeaf continues to promote tree preservation and tree replacement programs. The Virginia Department of Forestry has undertaken several efforts aimed at improving riparian zones and stabilizing stream banks. Volunteers from the Audubon Naturalist Society (and the NVSWCD) provide valuable data on water quality. The Park Authority staff continues to have a few people, working with a very small budget, who are slowly enhancing environmental efforts in the County's parks. EQAC thanks all these hard working groups, as well as many others we haven't mentioned, for their efforts in advancing environmental quality in Fairfax County.

EQAC would also like to commend the County Staff for their outstanding efforts. Of special note are the activities of the Environmental Coordinating Committee (ECC). EQAC has met with the ECC on environmental issues and will continue to do so. ECC's focus on environmental issues is resulting in improvements in County policy dealing with the environment and has greatly improved County actions in environmental areas. EQAC also notes that more and more attention is being given to water quality in DPWES – and the results are showing.

Members of EQAC wrote this report; however, we obtained most of the information contained therein from many County agencies. We thank them for their assistance. EQAC would especially like to acknowledge the contributions of two individuals. First, Noel Kaplan of the Environmental and Development Review Branch, Department of Planning and Zoning. Noel provides County staff support to EQAC. This means he sets up every EQAC meeting, attends every EQAC meeting, follows up on actions generated from the meetings, plus coordinates the inputs and publication of the Annual Report. EQAC thanks him for his hard work and long hours in our support. Second, Kambiz Agazi, Environmental Coordinator, Office of the County Executive. Kambiz attends every EQAC meeting and provides advice and suggestions. He often

follows up after the meetings by providing additional information. His insight and overview of County environmental activities are invaluable. EQAC thanks him for his assistance and valuable contributions.

We would like to commend the Board's actions, as noted in this report, in advancing the environmental quality of the County. Every year the County makes progress. However, much more needs to be done. EQAC is especially concerned about the impact of the County's financial shortfall on environmental programs. We would like to encourage you not to cut these valuable environmental programs and reverse the gains the County has made.

Your leadership continues to be essential to advancing environmental quality in Fairfax County by preserving and protecting environmentally sensitive areas. We in EQAC will continue to provide recommendations to you on how to achieve this goal. We look forward to working with you and achieving further progress in this area.

Respectfully submitted,

Robert D. McLaren, Chairman
Environmental Quality Advisory Council

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SCORECARD
Progress Report on 2001 Recommendations

I. WATER RESOURCES

Water Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC strongly recommends implementation of a Comprehensive Countywide Steam Management Program.	Staff agrees with this recommendation. A major aspect of this recommendation is being pursued through the Watershed Management Initiative – under which the staff will develop watershed master plans for the entire County in the next five to seven years. The baseline Stream Protection Strategy (SPS) report released in January 2001 included broad stream restoration and preservation recommendations. The SPS study is ongoing. The County is updating its base stream map of all stream channels through a perennial stream mapping project. Significant funding will be required to complete the development of the watershed master plans and to implement the recommendations of these plans.	EQAC's recommendation is on the way to being satisfied – if the County continues with its current activities in this area. EQAC is concerned about funding being available to continue these efforts. EQAC continues to emphasize this recommendation.	In process, with more to be done.
2. EQAC recommends the funding of the Stormwater Utility Program. The Program should place equal importance between environmental protection, restoration, and monitoring as compared to infrastructure improvement and maintenance. The Program should also include a Watershed Board to oversee the Program.	Staff is developing a Stormwater Utility (now called a Stormwater Environment Utility) implementation strategy. A study, *Conceptual Plan for a Comprehensive Stormwater Management Program*, was completed in March 2000. DPWES proposes to develop watershed master plans over the next five to seven years. As needs are identified in these plans, DPWES will initiate a public education effort. As public awareness increases, DPWES anticipates citizen understanding and support for a Stormwater Environmental Utility will become strong.	EQAC again reiterates its comments from prior years, with emphasis added. EQAC is concerned about the slowness of the process described by staff, with no clear end in sight. EQAC reiterates its recommendation, strongly urging the Board of Supervisors **speedily** adopt a Stormwater Environmental Utility Program. Without this program, EQAC is concerned about the continued availability of funds for a Comprehensive Countywide Stream Management Program.	No.

Water Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
3. EQAC recommends that the County initiate a study as to the sources of fecal coliform bacteria in County streams within 12 months and subsequently implement a plan to address the sources of actual threats to public health.	This recommendation is in the process of being addressed. A recently completed study in Accotink Creek identified the three dominant fecal coliform sources as geese, humans, and dogs. From a health viewpoint, the fecal coliform bacteria attributed to humans are the most critical to control. A two-year follow-up study is in progress to identify sources of human wastewater inputs to Accotink Creek. This study will develop and demonstrate a cost-effective approach to identifying physical sources of human wastewater that can be transferred to other County streams.	While efforts are underway, the process appears to be taking too long. EQAC recommends that the County speedily resolve this potentially serious public health problem.	Some progress, but more needs to be done.
4. EQAC recommends countywide monitoring to collect data on the efficiency of stormwater management ponds, other BMPs, and the effectiveness of required erosion and sediment control procedures, structures, and enforcement efforts. EQAC recommends the monitoring of streams prior to and after the issuing of stormwater waivers and special exceptions to see the impact on County streams.	The Kingstowne Environmental Monitoring Program assists the County in evaluating the sediment removal efficiencies of erosion and sediment controls in Kingstowne, and a second station will be installed nearby to evaluate nutrient loads from the entire Silver Springs segment of Dogue Creek. As part of the requirements for the renewed MS4 permit, the County will be monitoring additional areas in selected watersheds over the next five years. However, while a comprehensive countywide program to monitor the effectiveness of stormwater management ponds and BMPs would be desirable, it would be cost-prohibitive.	EQAC agrees that in today's financial climate, a comprehensive program is cost-prohibitive. However, EQAC remains concerned about the efficiency of the measures the County uses for stormwater management. Therefore, EQAC encourages the County to set up a selective program to collect data to evaluate the actual efficiency of these measures (incorporating this into the MS4 monitoring).	No.

Water Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
5. EQAC recommends an accounting of all costs, by both County and private individuals and entities, spent to counter the effects of siltation and erosion in County streams.	Given that the County is starting a comprehensive Watershed Planning project, a detailed assessment of the cost of not moving forward with an overall watershed protection and stream bank stabilization program is not practical. (Staff did supply some costs for dredging some lakes and ponds in the County, noting that efforts to get detailed activity information from many facility owners were unsuccessful. Staff also supplied some costs on some stream bank erosion mitigation projects.)	EQAC agrees with staff that further pursuit of data in response to this recommendation is not practical. However, EQAC emphasizes that the Watershed Planning project must move forward, followed by projects to protect healthy streams and restore damaged streams.	Sufficiently complete.
6. Given the increase in construction activities, EQAC commends the County for additional inspectors and training to handle construction site inspection responsibilities.	Staff recently established a 24-hour, 7-day-a-week complaint line for citizens to report suspected violations. The number of erosion and sediment violations has almost doubled in the past three years. The increase in the number of violations is a direct result of the increase in inspection staff and an increased emphasis on enforcing environmental regulations. Training on erosion and sediment control continues to be conducted periodically.	EQAC is pleased with the progress that has been made in this area. EQAC will continue to monitor progress and continues to recommend that the County monitor complaints.	Yes.

II. AIR QUALITY

Air Quality Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC again recommends that the County take steps to integrate air quality planning needs more directly into the County planning process.	EQAC's recommendations correctly note that there has been no direct action taken over the last year regarding staffing levels. Further, there has not been a concerted or coordinated effort to "take a hard look" at developing strategies that the County can pursue to address air quality issues. Staff agrees that, outside the context of the Metropolitan Washington Air Quality Committee's air quality planning efforts, there has not been a systematic evaluation of emission reduction strategies that the County may be able to pursue unilaterally. Staff notes that last years response is unchanged in that limited staff resources are available for the enhanced air quality functions recommended by EQAC.	While staff responses to EQAC's recommendations have been generally supportive, staff is limited by available resources. However, the situation in regard to air quality region and in Fairfax County has become even more dire since EQAC started recommending these actions. See this year's Air Quality Chapter for why this is so. EQAC reiterates these recommendations and strongly urges the Board of Supervisors to take a proactive role to ensure that Fairfax County comes into compliance with Federal air quality standards – standards that we do not now meet. Without such action, the County faces the serious financial consequences of loss of Federal transportation funding and the many other adverse economic and health impacts associated with air quality that does not meet federal standards.	No.
2. In the area of air quality monitoring, the County must develop its own capability to systematically evaluate and address air quality compliance.	See above.	See above.	No.

III. ECOLOGICAL RESOURCES

Ecological Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC recommends that the County BOS develop and implement a Countywide Natural Resource Management Plan. Two tasks should be done first: complete a Countywide Baseline Natural Resource Inventory and adopt a unified Natural Resource Conservation Policy. The BOS should reinstate funding for the Ecological Resources Inventory Committee.	Staff concurs with EQAC's recommendation. A number of activities are taking place that support this recommendation – with technical staff from several County agencies identifying actions needed to implement this recommendation. The team is collecting layers of natural resource data and compiling these data layers into a central natural resource management data set in the County's GIS. The Park Authority is in the process of creating a Natural Management Plan for parklands and is preparing a "green infrastructure" map of the County. They continue to work on developing a Natural Resource Inventory (NRI) program, with inventories complete for six parks. There are not, however, overall programmatic strategies that have been developed to provide for the identification, conservation, and long-term management of the County's natural resources.	As noted in earlier Annual Reports on the Environment, EQAC commends the Park Authority and fully supports its efforts. EQAC also notes more efforts are underway in this area than in previous years. However, unless increased staff and resources are allocated to these efforts, and an overall programmatic strategy is developed, EQAC's recommendation will not be satisfied. EQAC reiterates its recommendation.	Some progress, more than in past years.
2. EQAC recommends that the County BOS emphasize public-private partnerships that use private actions such as land purchases and easements to protect forests and other natural resources.	The public-private partnership between the Board of Supervisors and the Northern Virginia Conservation Trust (NVCT) was established as of June 30, 2001. The memorandum of understanding (MOU) detailing this partnership is for three years. Funding and execution of the agreement is contingent upon annual appropriations by the Board of Supervisors.	This partnership between the BOS and NVCT fully satisfies EQAC's recommendation. EQAC commends the BOS for this action. EQAC encourages the BOS to provide the required annual funding and to extend the MOU past three years.	Yes.
3. EQAC recommends that the topic of land preservations through easements continue to be publicized by the County	DPZ has the easements program brochure on their web site. A hard copy is in design and production. The FCPA has coordinated with various land trusts and will continue to pursue possible partnerships. FCPA is investigating possible advertising and networking strategies.	The continued presence of the information on the web site, the publication of the brochure, and advertising by FCPA satisfies EQAC's recommendation.	Yes.

IV. DEER MANAGEMENT IN FAIRFAX COUNTY

Deer Management Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC recommends that the Board of Supervisors continue to implement and monitor the comprehensive deer management program as set forth in the November 1998 Integrated Deer Management Plan and refined by the Deer Management Committee in the summer of 1999.	During 2001, managed hunts were conducted at Bull Run and Upper Potomac Regional Parks. Infrared activated cameras are used to address deer population densities with most of the parks under consideration for deer management. Sharpshooting is used to supplement managed hunts. During the growing season of 2001, a marked improvement was noted in the understory at Bull Run Regional Park. While it will take years for the habitat to rebound, these signs are encouraging. The Park Authority concurs with this recommendation and has been following the management principals referenced by EQAC.	EQAC notes that actions taken to date are a start, but the results are a long way from restoring natural areas to the former levels of biodiversity. The change at Bull Run Regional Park is encouraging; however, actions to manage the deer population need to continue and to be increased.	In process.
2. EQAC strongly endorses on-going public input into the Deer Management Plan.	The Deer Management Committee met twice in the Fall of 2001. They reviewed comments received in response to a questionnaire mailed to households located near parks. A County web page devoted to deer issues provide citizens with current information and continue to be updated and expanded. Citizens are able to send emails to this site to provide input, voice opinions, or to ask questions. Input is also received from citizens via telephone, other emails, public gathering, etc.	These efforts are providing the desired public input and should be continued.	Yes.

Deer Management Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
3. EQAC strongly recommends increased participation of the Fairfax County Park Authority in the deer management program.	Fairfax County Park Authority has worked in close cooperation with the Animal Control Division to identify parks that might be considered as sites for deer herd reduction. Sharpshooting has been successfully used at many of these sites. The Northern Virginia Regional Park Authority (NVRPA) has conducted successful managed hunts. Based on this, and a flawless safety record for these hunts, the County Wildlife Biologist will meet with the FCPA Board to encourage the addition of managed public hunts to FCPA deer management activities.	EQAC encourages continued, and increased, participation by FCPA in deer management.	In process.
4. EQAC believes the deer management program must address problems of small private property owners.	The Virginia Department of Game & Inland Fisheries (VDGIF) will issue permits to property owners experiencing damage from any wildlife, but many citizens are not aware of this program. DGIF and Fairfax County have increased efforts to inform citizens of this program. Additionally, state code now allows an extended urban archery deer hunting season. The County Deer Management web page provides information about methods available to private property owners.	While the staff response outlines some options available to small private property owners, more needs to be done. A more aggressive media campaign is one, perhaps publishing and distributing a brochure. The out-of-season permit program should be expanded to include more property owners (permits now typically are given only to owners of larger parcels). More consideration should be given to including private property owners in the County's program (such as with sharpshooters).	In process.

Deer Management Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
5. EQAC believes the management program must accomplish: (1) immediate, sustained reduction of deer population; (2) ongoing monitoring of availability of methods for maintaining population limits; (3) consideration of development and its effects on ecosystem health and biodiversity.	The deer management program continues to reduce local herds to levels consistent with long-term carrying capacity of remaining habitats. Fairfax County continues to monitor developments and progress of non-lethal methods of deer herd control. However, scientists conducting immunocontraception research at Penn State have stated that this method would not be available as a management tool for at least ten years (and longer without the development of new drug delivery methods).	The deer management program is making inroads into the overpopulation of deer in the County. However, this needs to continue until all local herds have been reduced to levels consistent with carrying capacity.	In process.
6. EQAC recommends the Board of Supervisors provide for a vigorous and enhanced program of public education.	Educational efforts have been underway since the start of the Deer Management Program. Additional measures are now being considered, including better use of the County's cable TV and updating of publications in the County Library system. (The staff response goes on to list a large number of educational efforts done in the last year.)	The County certainly has been conducting a vigorous program of public education. This program needs to be continued and enhanced such as suggested by County staff.	Yes.

V. WASTE MANAGEMENT

Waste Management Recommendation	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC strongly opposes the use of surplus funding to subsidize tipping fees. This approach is not sustainable and may have negative impacts on recycling programs.	Reserve balances from the Solid Waste Funds are no longer used to subsidize tipping fees. However, tipping fees cover the disposal costs, not necessarily the ancillary costs of the community based programs. In FY 2001 and FY 2002 the solid waste system received support for the General Fund to pay for certain elements of the waste disposal programs offered to County residents. General Fund support has been requested for this for FY 2003.	Originally, the tipping fees were used to cover disposal costs plus community based programs. With the change in waste disposal economics, this is no longer feasible. However, EQAC remains concerned that the community based programs do not have a secure funding source and may suffer in times such as now where the County faces financial shortfalls.	No.

VI. HAZARDOUS MATERIALS

Hazardous Materials Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC strongly encourages the Board of Supervisors to determine mechanisms through which the Conditionally Exempt Small Quantity Generator (CESQG) program can be reinstated.	The CESQG was reinstated in late FY 01. A new program, able to comply with DEQ regulations regarding acceptance of CESQG material, was developed in partnership with a private disposal firm, Safety-Kleen/Curbside, Inc. The contractor works directly with the generator, with the County backing the program through public notices.	DPWES reestablished, on a limited basis, the CESQG. The web site provides resource information for commercial hazardous waste generators that do not qualify as a CESQG. Given current economic conditions, EQAC is pleased that this level of the CESQG program is again functioning.	Partially completed.
2. EQAC recommends an aggressive public education campaign on how to properly dispose of household/residential, commercial, and industrial hazardous wastes.	A substantial amount of program information already exists, with brochures and web site information readily available. DPWES personnel will be working with the Fire and Rescue Department. DPWES will be coordinating with the Office of Public Affairs in include information in upcoming news releases.	EQAC knows of no aggressive effort to educate the public about household hazardous waste. There has been a 6% increase in participation in this program from FY 01, but that follows four years of static use or reduction in use of this program.	No.

VII. NOISE, LIGHT POLLUTION, AND VISUAL POLLUTION

Noise, Light and Visual Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC recommends the Board of Supervisors continue to monitor the FAA TRACON project.	The first phase of the EIS process was completed. The second phase, addressing a redesign of the airspace, is underway. A draft EIS for the airspace redesign effort had been anticipated for mid-2001; however, as of January 2002 the document has not been released.	The draft EIS has been released. See the Noise, Light, and Visual Pollution Chapter of this Annual Report on the Environment for EQAC's comments. Staff should continue to monitor this issue.	In process.
2. EQAC recommends that the Board of Supervisors investigate and establish zoning and noise requirements to ensure that any commercial helicopter service in the County does not result in an intolerable rise in noise levels.	There are no provisions in either the Zoning Ordinance or the Noise Ordinance that regulates helicopter noise. The Board included this issue as a Priority 2 item on the 2001 Zoning Ordinance Amendment Work Program. While the Helicopter Noise Working Group has meet sporadically, efforts to map area susceptible to such noise impacts have not progressed significantly due to other staff priorities and limited resources.	No progress is being made here due to lack of staff resources. Zoning and noise requirements need to be established before commercial helicopter service becomes established in the County. EQAC reiterates the recommendation.	No.
3. EQAC recommends that the Board of Supervisors participate in the update of the Noise Compatibility Study for Ronald Reagan Washington National Airport.	Due to the September 11, 2001, terrorist attacks, the subsequent restrictions placed on the airport, and resulting uncertainties regarding the extent and nature of future airport operations, the Study for the airport has been delayed. Staff concurs with EQAC's recommendation; however, no actions can be taken until the study resumes. Once the study resumes, the County should continue to monitor this issue and participate in study committees.	Since Supervisor Hyland is on the Part 150 Advisory Committee, this recommendation is satisfied if he, or another Supervisor, continues in that role if and when the study resumes.	In process.

Noise, Light and Visual Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
4. EQAC recommends that the Board of Supervisors direct DPZ develop a comprehensive ordinance to address lighting standards and practices in the County and the problems of light pollution.	The Zoning Ordinance currently only regulates glare and these standards have remained essentially unchanged since 1978. The Board recognized that these standards may no longer be suitable and included the review of glare performance standards as a Priority 1 item on the 2001 Zoning Ordinance Amendment Work Program. Staff is doing the background research. A proposed ordinance amendment will likely be brought to the Board in the Fall of 2002.	EQAC encourages the Board to move rapidly once the staff presents their proposed amendment.	In process.
5. EQAC recommends that the Board of Supervisors direct that future lighting fixtures installed in the County follow the recommendation of the Illuminating Society of North America (light be directed down).	The Board of Supervisors, on January 24, 2000, approved changes to the Citizen Petition Street Light Program Policy to reduce light pollution from County streetlights. Under the changed policy, new streetlights will use "cutoff" optics that totally direct light downward. Efforts are continuing to amend the PFM to formalize the requirement that new streetlight installations have cutoff optics. Semi-cutoff cobra head fixtures may be used where cutoff installations are not economically practical to need lighting standards. However, since January 2000, it has not been necessary to install any new semi-cutoff cobra head fixtures. Based on this experience, DPWES will standardize all new cobra head streetlight installations with the cutoff optic system.	EQAC encourages the amendment of the PFM to formalize this change. EQAC is pleased that, in these cases, that the recommendations of the Illuminating Society of North American will be followed.	Yes.

Noise, Light and Visual Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
6. EQAC recommends that the Board of Supervisors direct that all older lighting fixtures under County control that do not meet the above standard be replaced on a phased basis.	The Board of Supervisors, on January 24, 2000, approved changes to the Citizen Petition Street Light Program Policy to reduce light pollution from County streetlights. However, the Board concurred with using cutoff fixtures on new installations only. Older lights will not be retrofitted due to high costs. Additionally, some of the older fixtures do not meet current lighting standards – replacing them with cutoff fixture would require an increase in wattage. As a result, there would be a cost increase in replacing these old fixtures.	EQAC continues to note that Tucson, Arizona, has drastically reduced light pollution and believes that Fairfax County can do the same. EQAC reiterates the recommendation. Additionally, saying that replacing some fixtures with cutoff optics would result in cost increases is flawed logic. Since these do not meet lighting standards, they should be replaced with upgraded wattage lights. The replacement, with cutoff optics, would be cheaper than a replacement without cutoff optics.	No.
7. EQAC recommends that the Board of Supervisors work with VDOT and elected officials to replace existing roadway lighting fixtures (under the control of VDOT) with those in recommendation #5.	VDOT concurs with this recommendation with respect to new projects only. They agree to adhere to more environmentally sensitive criteria in the design of new roadway lighting projects. VDOT does not have sufficient data to support either concurrence or disagreement with the recommendation on existing lighting. Applying the same level of environmental sensitivity would require a detailed engineering review.	EQAC is pleased that VDOT has at least agreed to follow the recommendation for new projects. EQAC continues to recommend that a plan be developed to replace existing fixtures.	Partially completed.

Noise, Light and Visual Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
8. EQAC recommends that the Board of Supervisors direct County staff to prepare brochures and information on a web site to promote public awareness of light issues. EQAC also recommends a brochure be prepared to help educate architects, contractors, electricians, and builders to what the County permits in the field of illumination.	Staff concurs with this recommendation and believes that public education of any new regulations is extremely critical. However, staff believes that development of such materials prior to adoption of new regulations in this area would be an inefficient use of staff's time and resources.	EQAC agrees with Staff. The intent of the recommendation was to tie the production of brochures into the same process as changing the regulation as recommended under Recommendation #4.	No.
9. EQAC recommends that the Board of Supervisors immediately negotiate and execute an agreement with VDOT (as done by Prince William County) such that VDOT would delegate enforcement authority, including penalties, to the County regarding illegal signs in VDOT rights of way.	In the Countywide Sign Task Force Report presented to the Board in September 2001, there was a recommendation that the County enter into such an agreement with VDOT. The Board has asked for additional input from the community on the Task Force recommendations.	EQAC reiterates its recommendation and urges the Board of Supervisors to adopt the Task Force recommendations.	No.
10. EQAC recommends that the Board of Supervisors use a multimedia approach on illegal signs to make citizens aware of Title 48 (Virginia's nuisance statue) as has been done in Loudoun County.	In the Countywide Sign Task Force Report presented to the Board in September 2001, there was a recommendation that there be a media campaign as this type. The Board has asked for additional input from the community on the Task Force recommendations.	EQAC reiterates its recommendation and urges the Board of Supervisors to adopt the Task Force recommendations.	No.

Noise, Light and Visual Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
11. EQAC recommends that the Board of Supervisors authorize the use of trained and certified volunteers to remove illegal signs from public property or the right-of-way.	The Countywide Sign Task Force has been advised that the Board does not have this authority. There have been discussions with VDOT representatives regarding the Adopt-a-Highway program, although under this program all litter and debris must be removed, not just illegal signs. It might be beneficial to include information on this program in any media campaign as discussed in Recommendation #10.	EQAC encourages volunteers in the Adopt-a-Highway program to remove illegal signs along with trash and debris, and supports any expansion of this program; however, infrequent sweeps of the roadways will do little to combat illegal signs since they rapidly reappear.	No.
12. EQAC recommends that the Board of Supervisors request the Commonwealth Attorney's Office and the Virginia courts Virginia District Court to sentence non-violent offenders to assist in litter and illegal sign removal.	The Sheriff's Office Community Labor Force has expanded its efforts and has continued to provide manual labor services for removal of trash and debris from roadsides. The Sheriff's Office will continue to work with the County in these efforts, including the removal of illegal signs. The Sheriff's Office suggests that the Board of Supervisors should consider requesting the Circuit Court, the General District Court, and the Juvenile and Domestic Relations Court to use the Community Labor Force as a sentencing alternative for non-violent offenders.	Using the Community Labor Force does partially satisfy EQAC's recommendation. EQAC agrees with the Sheriff's Office recommendation that the Courts consider the Community Labor Force as a sentencing alternative.	Partially completed.
13. EQAC recommends that the Board of Supervisors authorize the hiring of additional employees to address illegal signs.	In the Countywide Sign Task Force Report presented to the Board in September 2001, there was a recommendation that the Board should re-establish a County program for the removal of roadside litter (which would include illegal signs). The Board has asked for additional input from the community on the Task Force recommendations.	EQAC reiterates its recommendation and urges the Board of Supervisors to adopt the Task Force recommendations.	No.

LAND USE AND TRANSPORTATION

Land Use and Transportation Recommendation	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC agrees with the recommendations of the TCC Task Force on Land Use and Transportation in their alternative transportation and land use activity strategies study.	A number of activities took place in 2001 that support elements of EQAC's recommendation: (1) Adoption of a Comprehensive Plan amendment for the Merrifield area; (2) Adoption of a Comprehensive Plan amendment for the Dulles Airport Access and Toll Road corridor; (3) Adoption of a Comprehensive Plan amendment for the Engineer Proving Ground site; (4) Adoption of a Zoning Ordinance amendment establishing the Planned Residential Mixed Use District; (5) Consideration of a Comprehensive Plan amendment that would add a Revitalization section to the Policy Plan; and (6) Consideration of revisions to the Countywide Trails Plan. Staff recommends that EQAC meet with the Planning Commission and the Transportation Advisory Committee to foster an exchange of ideas on the issue raised by EQAC.	EQAC has revised the Land Use and Transportation chapter in the 2002 Annual Report to reflect EQAC's continuing study in land use and transportation. EQAC has met with the Planning Commission and the Transportation Advisory Committee to discuss air quality issues that are associated with land use practices and transportation strategies. The County needs to continue to look at these practices and strategies with the goal of reducing the current negative impacts we are seeing in air quality, water quality, and the increasing congestion on County roadways.	No, but the process has started.

ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER I

WATER RESOURCES

I. WATER RESOURCES

A. OVERVIEW

The water resources of Fairfax County include its streams, groundwater, ponds and lakes. These serve as sources of drinking water, recreation, and habitat for a myriad of organisms. One-third of the land in the Fairfax County Park system, around 5,000 acres, is stream valley parkland. These stream valleys are significant corridors for the County trails system and wildlife.

1. Streams

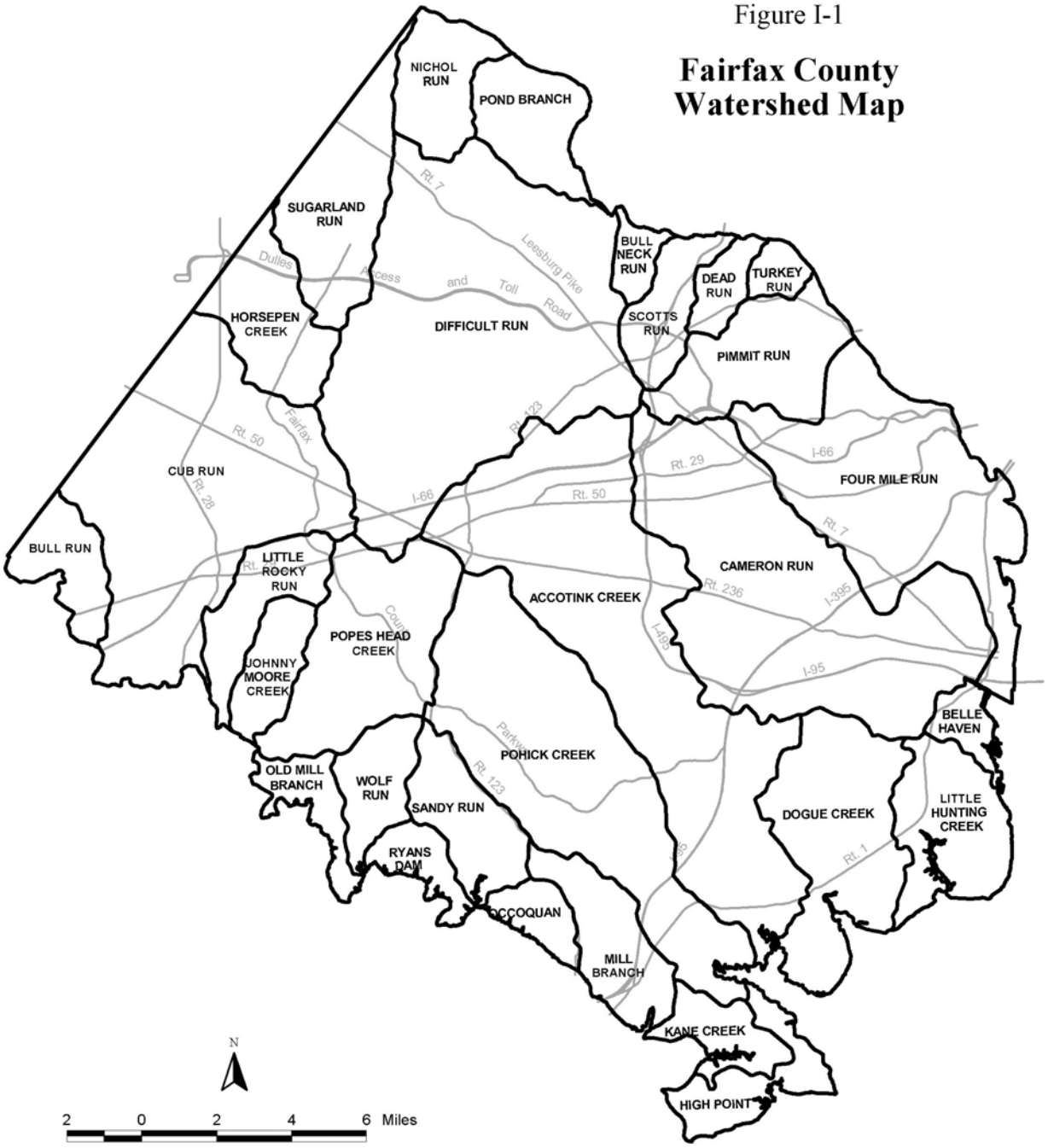
Fairfax County is criss-crossed by a variety of natural streams, often called runs or creeks. These streams are considered flowing water habitats. Rainfall soaks into the earth and drains to low points within the surrounding land, then emerges from the ground as seeps, springs and trickling headwaters. These tiny threads of running water join with others in the same drainage area to create a stream system. A stream is a system of fresh water moving over the earth's surface. There is a natural progression in size from the smallest tributaries to the largest rivers into which they eventually flow. Perennial streams flow throughout the year and intermittent streams flow only part of the year. There are over 900 miles of perennial streams within Fairfax County fed by smaller intermittent headwater streams.

2. Watersheds

A watershed is an area from which the water above and below ground drains into a particular stream, river system or larger body of water. Everyone in Fairfax County lives in a watershed with a name and drainage boundaries. The larger stream watersheds usually have sub-basins. There are 30 separate drainage basins or watersheds within the County (Figure I-1). For example, the largest watershed in Fairfax County, Difficult Run (58 square miles) has ten streams which drain into the main stream, Difficult Run. It, in turn drains into the Potomac River. The Potomac River watershed is a subbasin of the even larger watershed, the Chesapeake Bay watershed, which is 64,000 square miles and extends from New York through Pennsylvania, Delaware, West Virginia, Maryland, Virginia, and the District of Columbia. All Fairfax County streams are in the Potomac River watershed and subsequently the Chesapeake Bay watershed**.**

Figure I-1

Fairfax County Watershed Map



3. Stream Ecosystems and Communities

Within a stream are shallow areas called riffles where the velocity is rapid and the bottom consists of boulders, stones, gravel and/or sand. Dissolved oxygen levels are high because water is flowing over rocks, mixing air into the tumbling water. Alternating with riffles are deeper pools and runs where water speed slows and small particles of mineral and organic matter fall to the bottom and oxygen levels are reduced. Each of these stream regions has a diverse community of plants and animals which spend all or part of their life cycles in the water.

4. Communities

The aquatic food chain begins with leaves and other decaying plant and animal material called detritus. These are carried into the stream from the surrounding forests and fields by wind and water runoff. Food sources also include aquatic vegetation such as algae. Bottom–dwelling (benthic) Macro (large) invertebrates (back-boneless) animals eat this organic matter. These include snails, clams, aquatic worms and crustaceans such as crayfish, but the most ecologically important are the aquatic insects such as stoneflies, mayflies, caddisflies, and true flies. In turn, these macroinvertebrates are eaten by fish, birds, and other streamside wildlife, such as frogs, salamanders and small mammals.

5. Oxygen

Oxygen is vital to organisms that live in a stream just as it is to terrestrial animals. Submerged animals use oxygen dissolved in the water. Most aquatic insect larvae, such as mayflies and stoneflies, absorb oxygen through their body walls but many are aided by the use of structural gills. Fish absorb oxygen by drawing water in through the mouth where it passes over internal gills. High levels of dissolved oxygen are essential to the life functions of a healthy stream community.

6. Trees, Wetlands, and Buffers

A buffer of trees lining the banks of streams is another essential part of a healthy stream system. The temperature in a stream greatly affects how much oxygen it can hold. Since warmer water holds less oxygen, trees are vital along the bank or edge of stream or river. Shade from the tree canopy maintains cool water temperatures so the water will hold more oxygen.

Tree cover also provides food and floating detritus for shelter when leaves and branches fall into a stream. Streamside forests offer food, nesting sites, and protection to a great diversity of streamside wildlife including birds, turtles, beaver and snakes. Tree roots stabilize fragile stream banks and give cover to fish**,** crayfish and aquatic insects. Forested buffers absorb high percentages of excess nutrient runoff.

Wetland areas adjacent to streams can be forested or open wetlands. These wetlands serve as transitions to stream channels and help to attenuate the affect of stormwater and remove pollutants.

7. Nutrients

Nitrogen and phosphorus are nutrients essential to the growth and development of all plants. But an overabundance of either can damage stream ecosystems dramatically. Forested buffers can retain and utilize as much as 89% of the nitrogen and 80% of the phosphorus runoff associated with land use practices. In excess, these nutrients become major pollutants causing the rapid growth of algae in streams, rivers, lakes and estuaries. When the algae dies and begins to decay, the bacteria breaking down the algae uses up the dissolved oxygen necessary for other aquatic life.

8. Groundwater and the Water Cycle

Most of the water on earth, almost 98%, is in liquid form, in the oceans, lakes, ponds, rivers, and streams. Of the remaining 2%, some water is frozen in the polar ice and glaciers, some in the soil and some in the atmosphere in the form of vapor and some in the bodies of living organisms.

Water is evaporated from the oceans, and in much smaller amounts, from moist soil surfaces, from the leaves of plants and from the bodies of other organisms. This water, now water vapor, is carried up in the atmosphere by air currents. Eventually these water molecules fall to the Earth's surface as rain or snow. Much of the water that falls onto the land runs off into streams, then rivers and eventually reaches the ocean.

Some of the water that falls on the land percolates down through the soil until it reaches a zone of saturation. In the zone of saturation, all pores and cracks in the rocks and soils are filled with water (groundwater) The upper surface of the zone of saturation is called the water table. This groundwater provides the base flow in streams and is the reason that streams and rivers have flow when it is not raining. It is this groundwater that is the source of water in wells and provides water for plants through their roots. Eventually all groundwater reaches the oceans, thereby completing the water cycle.

B. POLLUTANTS AND OTHER IMPACTS ON STREAMS

1. Point and Nonpoint Source Pollution

Water-polluting substances originate from either nonpoint or point sources. Nonpoint sources (NPS) include surface runoff, atmospheric deposition, and groundwater flow. Because of their diffuse and intermittent nature, NPS are difficult to control. NPS pollutant loads are greatest following rainfall events. A significant part of the NPS load consists of nutrients, including nitrogen and phosphorus (organic matter, fertilizer), that

are substances that stimulate algal growth. Other NPS pollutants are sediment (from eroding lands, construction sites, and stream banks during high-flow, high-velocity conditions), toxics (oil, paint, chemicals and metals), pathogens-fecal coliform bacteria (animal waste, failing septic and leaking sewer systems), and trash.

Point sources are specific locations that discharge pollutants. They are relatively constant and provide a steady flow of pollutants. In the Potomac Basin, most point sources are either wastewater treatment plants (WWTPs) or industrial discharges. Point sources contribute relatively small portions of the nutrient loads during high flows and the majority during low flows.

2. The Effect of Imperviousness on Streams

As development occurs, impervious surface increases as driveways and buildings are placed on land that once had trees and other vegetative cover that absorbed water and its contents. With the increase in impervious surface and loss of vegetative cover, there is a concurrent increase in the amount and speed of stormwater running off the land carrying sediment to nearby streams. Sediment is a major non-point source pollutant reaching streams and rivers that drain to the Chesapeake Bay. Silt and sand scour stream channels, which erodes the banks and causes loss of tree cover. This in turn allows water temperature increases. This silt and sediment also gets deposited on the bottom covering where macroinvertebrates live, cutting off their oxygen supply. This change in bottom substrate usually results in a change in the diversity of organisms--a loss in the numbers and kinds of animals and plants in stream. There is usually a concurrent increase in the numbers of floods that occur where water spills over the banks of streams and onto adjacent lowlands. Over time, this increased flooding and sediment depositions leads to channel widening, loss of pools and riffles and increased pollutant levels. In urban and suburban watersheds, rain flows off impervious surfaces like parking lots and highways, carrying oil and other automobile wastes into streams. During summer storms, these heated surfaces contribute to raising the temperature of water runoff into streams.

C. STREAM AND WATERSHED ANALYSES

Ongoing testing is conducted by the, the Fairfax County Department of Public Works and Environmental Services (DPWES), Fairfax County Health Department, the Virginia Department of Environmental Quality (VDEQ), and other organizations and agencies. The Audubon Naturalist Society, the Northern Virginia Soil and Water Conservation District, and the Health Department Adopt-A-Stream program also provide volunteer help and data. At present the Health Department and the Department of Public Works and Environmental Services are both doing comprehensive monitoring of Fairfax County streams. The summary of all this data has provided the first comprehensive understanding of the condition and health of Fairfax County's streams.

1. Countywide Stream Assessments

a. Countywide Stream Protection Strategy Baseline Study

i. History

In September, 1997, the Fairfax County Board of Supervisors requested that staff from the Department of Public Works and Environmental Services (DPWES) evaluate the Montgomery County Maryland, Countywide Stream Protection Strategy to determine its applicability in addressing water quality issues and provided an initial allocation of $250,000. Upon completion of the evaluation in 1998, the Board approved an additional $250,000. Work was initiated in September of 1998, was completed by December 2000 and was published in January 2001. This study gives a holistic ecological assessment of all County streams.

ii. Study Parameters

All major non-tidal streams and tributaries within the 30 watersheds of the County have been assessed. The field component of this assessment involved the collection of data from a total of 138 sites/reaches, 13 of which were established as Quality Assurance/Quality Control (QA/QC) sites. Of the 125 principal monitoring sites, 114 were reflective of conditions within Fairfax County and 11 were sampling locations in nearby Prince William Park and used to aid in the development of "reference conditions" to which all sites were compared. Data collected on the health of streams included the four components and a numeric ranking for overall quality was assigned (See Figures I-2 through I-5):

1) Fish taxa present (numbers and diversity of fish);
2) Index of biotic integrity (the numbers and kinds of benthic macroinvertebrates present);
3) General evaluation of localized watershed and stream features including stream channel and adjacent steam valley habitat, stream morphology; and
4) Calculations of the overall percent impervious cover within each watershed based on upon available Fairfax County GIS data.

The County will continue long term monitoring of streams with a 5-year rotating schedule of sampling so that each site will be resampled at least every five years. Additional data on smaller tributary streams will continue to be provided by volunteer water quality monitors from the Northern Virginia Soil and Water Conservation District and Audubon Naturalist Society. (See below for description of these Volunteer Monitoring Programs.)

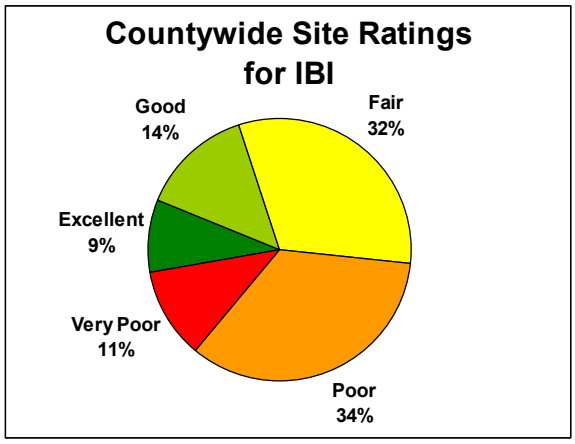


Figure I-2. Percentage of SPS monitoring sites scoring in each of the five IBI quality categories.

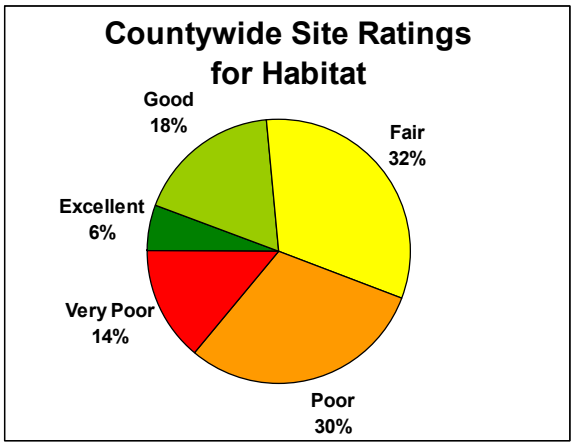


Figure I-3. Percentage of SPS monitoring sites scoring in each of the five Habitat quality categories.

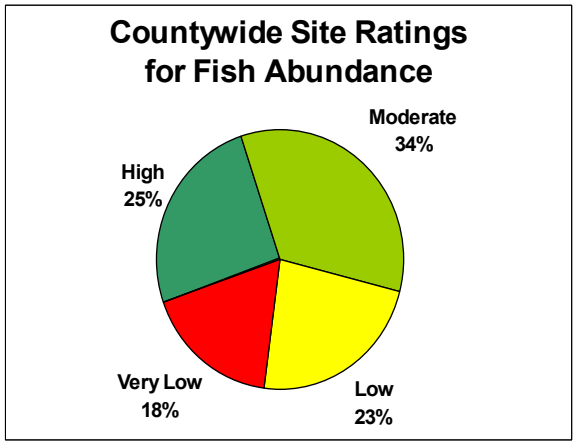


Figure I-4. Percentage of SPS monitoring sites scoring in each of the four Fish abundance categories.

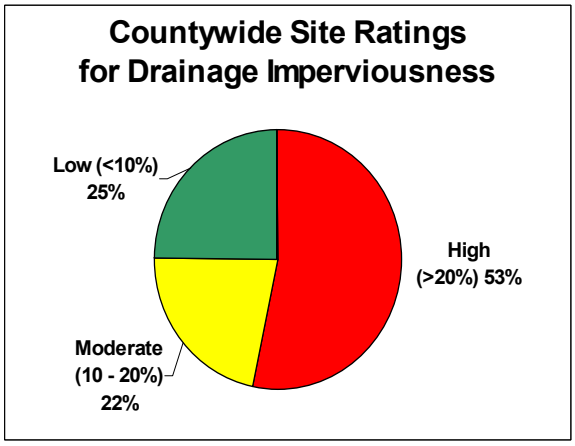


Figure I-5. Distribution of Imperviousness at SPS monitoring sites.

Source of Figures I-2 through I-5: Fairfax County Department of Public Works and Environmental Services, *Fairfax County Stream Protection Strategy, Baseline Study*, January, 2001.

iii. Ranking and Results

The ultimate numeric score for each sampling location reflects the site's degree of departure from reference or "highest-quality" conditions. These composite values were then assigned to one of the following qualitative categories: Excellent, Good Fair, Poor and Very Poor.

Using an indicator of biological integrity (IBI) as a basis, the county stream site were ranked: Excellent - 8.6%, Good – 14.7%, Fair – 31%, Poor 32.8% and Very Poor –12.9%. Those watersheds that were in good and excellent health had the least amount of impervious surface and the watersheds that were most heavily degraded had the greatest impervious surface (Figure I-6).

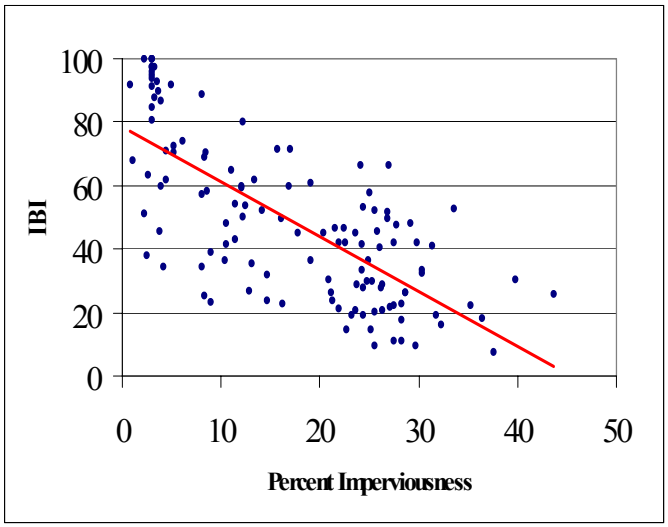


Figure I-6. Trend line indicating that Biological integrity, as measured by an Index of Biotic Intetrity (IBI) for benthic macroinvertebrates, generally decreases with increasing percent imperviousness. Source: Fairfax County Department of Public Works and Environmental Services, *Fairfax County Stream Protection Strategy, Baseline Study*, January, 2001.

iv. Recommended Management Strategies

Based on overall stream rankings and projected development within each watershed, three management categories were established to provide recommendations for future efforts:

1) Watershed Protection – Watersheds in this category will be areas with low development density and which currently possess streams with biological communities that are relatively healthy and have a composite ranking of Good or Excellent. The primary goal of this category is to preserve biological integrity by taking active measures to identify and protect, as much as possible, the conditions responsible for the current high- quality rating of these streams.

2) Watershed Restoration Level I- Watersheds in this category have a composite rating of Fair or, rarely, Poor and a projected imperviousness of less than 20%. The primary goal of this category is re-establish healthy biological communities by taking active measures to identify and remedy causes of stream degradation, both broad scale and site-specific.

3) Watershed Restoration Level II –Watersheds here have a composite rating of Poor, Very Poor or rarely, Fair and a projected imperviousness of greater than 20%. This category will likely be categorized by high development

density and significantly degraded stream segments. The primary goal is to prevent further degradation and to take active measures to comply with Chesapeake Bay initiatives.

The report is online at:
http://www.co.fairfax.va.us/gov/dpw/spss/homepage.htm

v. 2001 Update on Countywide Stream Assessment

During 2001, the Stream Protection Strategy (SPS) program completed sampling at 29 randomly selected sites chosen from among the 125 monitoring locations established during the 1999 baseline study. This represents about 25% of the original monitoring sites. This sampling scheme will be repeated annually. The 11 reference sites within Prince William Forest Park have been and will continue to be monitored on an annual basis.

In an attempt to assess possible seasonal influences on fish distribution patterns - and their resulting impact on the development of useful indices – a spring sample , in addition to the summer sampling protocol, was added. The report for 2001 should be available on line at: http://www.co.fairfax.va.us/gov/DPWES/environmental/SPS_Main.htm

The results of the study do not show significant changes from the original baseline data.

b. Volunteer Water Quality Monitoring Programs

i. Northern Virginia Soil and Water Conservation District (NVSWCD)

The Northern Virginia Soil and Water Conservation District (NVSWCD) manages a water quality monitoring program in Fairfax County, which is conducted by qualified volunteers. The program includes training and certification of monitors, data management and analysis, and quality control. Four times a year, volunteers conduct a biological assessment, using the Save Our Streams protocol. They determine the general quality of the water by evaluating the type and diversity of aquatic macroinvertebrates. They also record their observations of the surrounding watershed, including land uses, the amount of streamside and stream bank vegetation, tree canopy, and signs of erosion and other pollution. The monitors conduct water chemistry tests for temperature, turbidity, and nitrates, to assess the water quality. In 2001, 35 sites reported winter data, 30 reported in the spring, 61 in the summer and 36 in the fall.

ii. Audubon Naturalist Society (ANS)

ANS also manages a volunteer water quality monitoring program in the region that currently includes 30 monitors, with an average of four monitors for each of the nine sites in Fairfax County. Two sites are in E. C. Lawrence Park and are monitored by Park staff. The ANS program uses a modified version of the EPA's Rapid Bioassessment II protocol, which includes assessment of in-stream and streamside habitat parameters and a survey of benthic macroinvertebrate populations. There are three required monitoring sessions (May, July, and September) and an optional winter monitoring session between December and February. ANS staff performs data entry and quality control activities. ANS also furnishes all monitoring equipment and training. Monitor training includes macroinvertebrate identification (order and family level), protocol practicum, habitat assessment, and benthic macroinvertebrate adaptations. Monitors are recruited in semi-annual introductory workshops. The water quality monitoring program is part of a larger watershed awareness program that includes slide show and video presentations, watershed walks, and other presentations.

iii. Fairfax County Park Authority

Staff at several Park sites has worked with citizens on stream monitoring projects. Three nature centers and Lake Accotink Park are working to collect long term data at established monitoring points. The Park Authority has also recruited a volunteer to act as a Stream Cleanup Coordinator. This individual will work to organize stream clean-up events in non-staffed stream valley parks.

2. Fairfax County Health Department Water Quality Report

The Division of Environmental Health in the County Health Department produces the other comprehensive review of Fairfax County streams. In 2001, data were collected from 84 sampling sites throughout 25 of 30 watersheds in Fairfax County. A total of 1,656 stream samples were collected for analysis.

Twenty-seven site visits were made by the Health Department to investigate 12 stream complaints in 2001. One(1) complaint dealt with dumping and trash in streams, six(6) were for color and odor, two(2) dealt with possible sewer line breaks, two (2) with runoff problems, and one(1) was related to a broken water main in the stream bed.. The twelve complaints were initially investigated by the Fairfax County Health Department and referred to the proper agency or resolved utilizing Health Department procedures and local ordinances .

The overall water quality of the streams in Fairfax County is considered fair for fecal coliform bacteria and good for chemical and physical parameters by the Health Department.

The report is online at: http//www.co.fairfax.va.us/service/hd/strannualrpt.htm.

a. Fecal Coliform

These bacterial organisms are found in the intestinal tracts of warm-blooded animals including humans, and therefore can be indicative of fecal contamination and the possible presence of a pathogenic organism. In surface waters, Virginia Water Quality Standards have a dual standard for fecal coliform bacteria: 1) An instantaneous standard of 1,000 fecal coliform bacteria per 100 ml of water, which is applicable for data sets with one or less sample per month, and 2) a geometric mean standard of 200 fecal coliform bacteria per 100 ml of water, which can only be calculated when two or more samples are available in a 30 day period.

--In the watersheds tested, Fairfax County streams met the standards of < 200 F.C./100 ml (considered GOOD) 16% of the time. Several streams had readings exceeding 1,000 F.C./100 ml. The Fecal Coliform Mean remains in the mid 500 range at 567 f.c./100 ml.

Because of excessive and persistently high coliform counts in Accotink Creek and Four Mile Run, TMDLs (Total Maximum Daily Loads) are underway. See description Stream Reports.

b. Dissolved Oxygen

The presence of dissolved oxygen (D.O.) is essential for aquatic life, and the type of aquatic community is dependent to large extent on the concentration of dissolved oxygen present. Dissolved oxygen standards are established to ensure the growth and propagation of aquatic ecosystems. The minimum Virginia state standard for dissolved oxygen is 4.0 mg/l.

--Ninety-nine percent (99%) of the samples collected for determination of D.O. were above the 4.0 mg/l range. Of the remaining 1%, a little over one-third of the samples below 4.0 mg/l were from two sampling sites Wolf Run Creek and Little Hunting Creek. And half of the samples below 4.0 mg/l were related to low rainfall during the months of September (2.2 inches) and November (0.8 inches)

The Mill Branch sampling station showed readings below 4.0 only 50% of the time (2 out of 4 samples collected in 2000). This sampling site is located downstream from a debris landfill and could indicate that organic contaminants are entering the stream. This site has been dropped from the sampling schedule after 4 samples were collected in 2000 and it was determined that the amount of available water to sample was insufficient for proper evaluation. This sampling site is monitored by Virginia's Department of Environmental Quality-Waste Management Division.

c. Nitrate Nitrogen

Nitrate Nitrogen is usually the most prevalent form of nitrogen in water because it is the end product of aerobic decomposition of organic nitrogen. Nitrate from natural sources is attributed to the oxidation of nitrogen in the air by bacteria and to the decomposition of organic material in the soil. Fertilizers may add nitrate directly to water resources. Deposition of nitrogen compounds from air pollution also occurs. Nitrate concentrations can range from a few tenths to several hundred milligrams per liter. In non-polluted water, they seldom exceed 10 mg/l. Nitrate is a major component of human and animal wastes, and abnormally high concentrations suggest pollution from these sources.

--The samples for nitrate nitrogen ranged from a low of 0.01 mg/l to a high of 6.1 mg/l. The overall nitrate nitrogen geometric mean was 0.6 mg/l, well below the maximum limit of 10 mg/l No samples were above the maximum contaminate level of 10 mg/l**.** Station 25-04 (Old Mill Branch watershed) and Station 05-02 (Bullneck Run) had the highest geometric mean of all samples collected in 2001 from the high of 6.1 mg/l in February to a low of 0.1 in October.

d. Phosphorus (Total)

Phosphorus is found in natural water in the form of various types of phosphates. Organic phosphates are formed in the natural biological process--by organisms existing in the water, contributed to sewage in body wastes and food residues, and/or formed in the biological treatment process for sewage. Condensed phosphates and orthophosphates are found in treated wastewater, laundry detergent, commercial cleansing compounds, and fertilizers. Phosphorus is essential to the growth of organisms and is usually the nutrient that limits growth of organisms in a body of water. Therefore the discharge of raw or treated sewage, agricultural drainage, or certain industrial wastes may stimulate nuisance quantities of photosynthetic aquatic organisms and bacteria.

-- There is no established limit for phosphorus in stream water. This year's geometric mean of 0.10 mg/l does not indicate a significant increase over prior year's average

e. Temperature

The existence and composition of an aquatic community also depends greatly on the temperature characteristics of a body of water. The maximum standard for free flowing streams is 89.9^{o} F (32^{o} C).

--The temperature range for all stream water samples collected in 2000 was 32^{o} F for the low in January and 84^{o} F for the high in August. The average temperature was 55^{o} F.

f. Heavy Metals and Toxins

The presence of heavy metals in stream water indicates possible discharge of household and industrial waste into streams. Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver are monitored for based on their occurrence in industrial and household waste, their potential health hazards, and as part of the Virginia Department of Environmental Quality water requirements.

-- All results are within required limits**.**

g. pH

Stream pH is an important factor in aquatic systems. The pH range of 6.0 - 9 generally provides adequate protection of aquatic life and for recreation use of streams.

--The pH ranged from a low reading of 5.2 to a high of 9.3 for all samples. Fifteen samples were above the 9 limit and six samples were below the 6.0 limit. Follow up testing indicated normal pH.

h. Summary

The average geometric mean for fecal coliform at several of the stream sample sites is approaching and surpasses 1000 f.c./100 ml. (This is definitely not in the good range). The chemical and physical parameters have remained constant over the past five years. Therefore, the Health Department considers the overall water quality of Fairfax County watersheds fair for fecal coliform and good for chemical and physical parameters.

The Health Department ends its Water Quality Summary Statement with the following caveat:

"In summary, any open, unprotected body of water is subject to pollution from indiscriminate dumping of litter and waste products, sewer line breaks and contamination from runoff pesticides, herbicides, and waste from domestic and wildlife animals. Therefore, the use of streams for contact recreational purposes, such as swimming, wading, etc. which could cause ingestion of stream water or possible contamination of an open wound by stream water, should be avoided."

3. Health Department Volunteer Monitoring Program (Adopt-A-Stream)

This program, which is administered by the Environmental Services Section of the Health Department, was initiated in 1989 in response to the recommendation of the County's Environmental Quality Advisory Council. Its objective is to make people aware of stream pollution issues and to establish a network for reporting pollution incidents. At present, 90 groups, representing more than 500 individuals, participate in

the program. DPWES uses information from the Adopt-A-Stream program to help identify pollution sources.

4. Virginia Department of Environmental Quality (DEQ)

There are thirteen (13) sites in Fairfax County currently scheduled for inclusion in the Virginia Department of Environmental Quality monitoring: Accotink Creek, Cub Run (2 sites), Difficult Run (2 sites), Dogue Creek, Elklick Creek, Giles Run, Popes Head Creek, Pohick Creek (2 sites), Sandy Run and Sugarland Run. Failure to meet designated water quality standards may result in a stream being placed on the 303(d) list for impaired state waters.

a. Occoquan River and Basin Management

The Occoquan River lies between the southern border of Fairfax County and the northern border of Prince William County. The River has been dammed near the town of Occoquan. The Occoquan Reservoir created by the damming serves as one of two sources of drinking water for the Fairfax County Water Authority which operates a facility and withdraws water from the Reservoir. Because of its use as drinking water, water quality in the Reservoir is highly monitored and water from sewage treatment plants entering the Reservoir is highly treated.

i. Upper Occoquan Sewage Authority (UOSA)

UOSA is located in Centerville, VA. It serves the western portions of Fairfax and Prince William Counties and the Cities of Manassas and Manassas Park. The water reclamation plant includes primary-secondary treatment followed by advanced waste treatment processes: chemical clarification, two-stage carbonation, multimedia filtration, granular activated carbon adsorption, post carbon filtration, breakpoint chlorination and dechlorination. The plant's capacity is 32 million gallons per day (mgd) and is being expanded to a capacity of 54 mgd. Completion of expansion is expected by 2002/2003. UOSA operates under a Virginia Pollutant Discharge Elimination System (VPDES) Permit. The permit limits and 2001 plant performance are listed in Table I-1.

In 2001, both the plant maximum 30-day average flow and the annual average daily flows were below the design flow of 32 mgd. The maximum daily flow day during the months of March, April, May and June 2001 exceeded the plant capacity. The excess flows were diverted to the plant's equalization retention ponds and were subsequently treated during days of lower flows. UOSA produces and treats two types of residuals: biosolids from conventional treatment and lime solids from chemical treatment. Biosolids are anaerobically digested, which produces stable compounds that are conditioned with lime and

dewatered and hauled off-site to be land applied or landfilled. The lime solids are thickened and dewatered and landfilled in a permitted industrial landfill.

Table I-1. UOSA Permit Requirements and 2001 Performance

Parameter	Limit	Performance
Flow	32 mgd	24.4 mgd
Chemical oxygen demand	10.0 mg/l	9.0 mg/l
Turbidity	0.5 NTU	0.3 NTU
Total Suspended Solids	1.0 mg/l	0.3 mg/l
Total Phosphorus	0.1 mg/l	0.07 mg/l
Surfactants, mg/l	0.1 mg/l	0.026 mg/l
Total Kjeldahl Nitrogen	1.0 mg/l	0.5 mg/l
Disinfection Minimum Chlorine Residual	0.6 mg/l	1.1 mg/l
Dechlorination Chlorine Residual	Non detect	Non detect

Source: Upper Occoquan Sewage Authority

ii. Occoquan Watershed Monitoring Laboratory (OWML)

The Occoquan Watershed Monitoring Program (OWMP) is administered by the OWML and has been in operation since 1972. It is funded by the Fairfax County Water Authority and the six jurisdictions within the watershed: Fairfax, Prince William, Loudoun, and Fauquier Counties, and the Cities of Manassas and Manassas Park. The program consists of nine (9) stream monitoring stations (automated flow monitoring at all and storm sampling at most) and four (4) Occoquan Reservoir stations. Base flow samples in the streams, and all sampling in the Reservoir is done manually. In addition to surface and bottom water samples, profiles of DO, temperature and pH are also obtained at the Reservoir stations. Sampling is done weekly during the growing seasons and biweekly or monthly (if ice is present) in winter. The "health of the watershed in terms of nutrients, metals, pH, dissolved oxygen and temperature remains the same as previous years." (Occoquan Watershed Monitoring Laboratory, report from Adil Godrej, June 20, 2002.) The Lake Manassas program is used for monitoring water and sediment at seven (7) stream stations and eight (8) lake stations. The eutrophication status of the Occoquan Reservoir and Lake Manassas were within the same range as before, moderately eutrophied but holding steady.

The OWML monitors water samples quarterly for organic synthetic organic compounds (SOCs) in a program established under the recommendation of EQAC in 1982. In 1988, the OWML began monitoring sediment and fish samples within the reservoir for SOCs. The Lake Manassas program also funds monitoring of SOCs at their stations. The most frequently detected SOC is Atrazine, usually detected in springtime and early summer when it is being land applied. Concentrations "are usually lower" than the maximum contaminant level (MCL) of 3 micrograms/liter for drinking water. (Occoquan Watershed

Monitoring Laboratory, report from Adil Godrej, June 20, 2002.) The pesticide Dual (metolachor) and phthalates are regularly found in concentrations one or more order of magnitude below the MCL.

b. Noman M. Cole Jr. Pollution Control Plant (NCPCP)

The NCPCP, located in Lorton, is a 54 million gallon per day (mgd) advanced wastewater treatment facility that incorporates preliminary, primary, secondary and tertiary treatment processes to remove pollutants from wastewater generated by residences and businesses in Fairfax County. The original plant, which began operation in 1970 at a treatment capacity of 18 million gallons a day (mgd), has undergone two capacity and process upgrades to meet more stringent water quality standards. After treatment, the wastewater is discharged into Pohick Creek, a tributary of Gunston Cove and the Potomac River. The plant operates under a VPDES permit. The Plant is required to meet effluent discharge quality limits established by the Virginia Department of Environmental Quality (DEQ). The following table represents the facility's performance and current effluent monthly limitations.

Table I-2. NCPCP Permit Requirements and 2001 Performance

Parameter	Limit	Performance (12/31/01)
Flow	54 mgd	41.58 mgd
$CBOD_5$	5 mg/l	2 mg/l
Suspended Solids	6 mg/l	2.0 mg/l
Total Phosphorus	0.18 mg/l	0.10 mg/l
Chlorine Residual	Non Detect	Non Detect
Dissolved Oxygen	6.0 mg/l (minimum)	8.7 mg/l
pH	6.0-9.0 (range)	7.2-7.7
Fecal Coliform	200/100ml	3.4/100ml
Total Nitrogen	None (currently)	20.6 mg/l

Source: Department of Public Works and Environmental Services

Construction to expand the plant treatment capacity to 67 mgd began in 1997 with completion planned by the end of 2002. The includes process upgrades to remove ammonia to less than 1 mg/l and total nitrogen to less than 8 mg/l in order to meet Virginia Water Quality Standards and the Chesapeake Bay goals for total nitrogen. Also included in the project are: flow equalization tanks, new/upgraded laboratory for water quality testing, upgraded odor control systems, new instrumentation and control systems and a new septage receiving facility.

5. Special Stream Reports and Programs

a. TMDLs (Total Maximum Daily Loads)

i. Accotink Creek TMDL

Due to excessive fecal coliform counts, a 4.5 mile segment of Accotink Creek in Fairfax County, beginning at the confluence of Crook Branch and Accotink Creek to the start of Lake Accotink, was placed on the 1998 Virginia 303(d) TMDL (Total Maximum Daily Load) list. A TMDL is a highly structured watershed-specific plan for bringing an impaired body of water into compliance with the Clean Water Act goals. A two-year study began in December 1998, headed by the U.S. Geological Survey, in partnership with the Virginia Department of Conservation and Recreation, (DCR), the Virginia Department of Environmental Quality (DEQ), and Fairfax County. Study was complete in fall of 2001. The sample collection and analysis, which began in April 1999, to determine the "type" of fecal coliform found in streams is now complete. Preliminary results indicate the source of bacteria are distributed as follows; 40% waterfowl, 20% human, 13% dogs, 5.4% raccoon, 1.4% deer, and 21% other. A draft TMDL has been published by the Virginia Department of Environmental Quality and the final report was due May 1,2002. The draft TMDL includes a goal to reduce the human sources of fecal coliform by 99%. A study by USGS initiated in the summer of 2001 will identify the sources of the inputs of fecal coliform. The study will be conducted over a three-year period.

ii. Four Mile Run TMDL and the Four Mile Run Program

Although only the very upper reaches of Four Mile Run occur in Fairfax County, it is important to note the existence of a TMDL for Four Mile Run and the participation of Fairfax County in the Four Mile Run Program.

The Four Mile Run Program is the oldest continually active program of the Northern Virginia Regional Commission (NVRC). The four jurisdictions (Arlington County, Fairfax County, the City of Falls Church and City of Alexandria) through which Four Mile Run flows are involved in the program. The program was founded in 1977 to ensure that future development would not result in increased flooding in the watershed. Today all development and redevelopment is analyzed through the Four Mile Run Computer Model to determine whether on-site detention of stormwater is necessary to prevent downstream flooding. In 1998, the Four Mile Run Agreement was amended to address urban water quality issues in addition to flooding.

The Four Mile Run Fecal Coliform Study to determine the sources of fecal coliform in the watershed using DNA was completed in 2000. The study found

that waterfowl contribute over one-third (31%) of that bacteria that could be matched, 18% from humans, 13% from dogs, 6% from deer, 19% from raccoons and 13% from other sources.. Bacteria from humans appear to be highly localized. There were indications in that without regard to specific host animals, E. coli bacteria seem to regrow, through cloning, within the storm drains and stream sediments, which in turn perpetuates bacteria levels. Efforts are underway to study this hypothesis,

NVRC was given a grant from the Virginia Department of Environmental Quality (DEQ) and the development of a TMDL (Total Maximum Daily Load) for bacteria in Four Mile Run by May 2002. A TMDL is a highly structured watershed-specific plan for bringing an impaired body of water into compliance with the Clean Water Act goals. The implementation plan will be developed within two years of the EPA acceptance of the proposed TMDL plan**.**

iii. Bull Run TMDL

NVRC has been approached by the Virginia Department of Environmental Quality concerning the development of TMDLs for impaired streams in the Occoquan watershed. The first two will be for streams outside Fairfax County, Licking Run and Cedar Run. However a TMDL for degradation of the streams benthic community is scheduled to be completed for Bull Run in Fairfax by 2008.

b. Optical Brightener Monitoring (OBM) Program

NVRC conducted optical brightener monitoring for the third year in Four Mile Run watershed during the summer of 2001. OBM is a quick and inexpensive way of uncovering certain types of cross-connections between sanitary sewer lines and streams. It detects the presence or absence of a common dye often found in laundry detergents and therefor often in sewage. Several potential cross-connections were discovered and referred to the appropriate agencies for action, including one in Fairfax County.

c. Kingstowne Stream Restoration Project

In 1998, Fairfax County, the Northern Virginia Soil and Water Conservation District, the U.S. Natural Resources Conservation Service, and two citizens groups- The Friends of Huntley Meadows and the Citizens Alliance to Save Huntley- formed a partnership to restore the Kingstowne stream**.** The Kingstowne stream is a tributary of Dogue Creek and is upstream of Huntley Meadows Park. Started in October and finished by December 1999, the Kingstowne Stream Restoration Project is now functional. The project used principles of geomorphology and soil bioengineering to create gentle meanders that slow the velocity of flow and natural vegetation to stabilize the stream banks. Testing has substantiated that erosion has been brought under control and water quality downstream is improved. Between

January and December 2001, 21 storm event samples and 12 base flow samples were collected and analyzed to determine pollutant loads in Dogue Creek, Based on the monitoring data, the 85% sediment removal efficiency was achieved for all storm events. Therefore no stop work orders were issued to the developer during 2001.

d. Gunston Cove Aquatic Monitoring Program

Gunston Cove is the site of the outfall of the Fairfax County Noman M. Cole sewage treatment facility. The primary objective of this George Mason University program is to determine the status of the ecological communities and physical-chemical environment in the Gunston Cove area of the tidal Potomac for evaluation of long-term trends. This should provide the basis for well-grounded management strategies to improve water quality and biotic resources in the tidal Potomac. It was recommended in the 2001 report that long term monitoring should continue.

Water quality has generally improved since the 1980s but is showing a decline from peak values around 1995. Algae are at lower levels than in the mid 80s and zooplankton (microscopic "animals' found in surface waters) have increased. In the cove white perch has remained dominant at steady levels over the period. Brown bullhead has declined since 1984 and blueback herring and alewife have declined since 1990. Spottail shiner and pumpkinseed numbers have shown a slight increase. In the river, the catch levels were slightly less than in the cove.

D. PONDS AND LAKES

All ponds and lakes in Fairfax County are man-made by excavation and/or the damming of streams. These open water impoundments have their own aquatic communities and have many of the same organisms as streams. Most provide recreational opportunities for humans. Due to increased runoff in more urbanized areas, they are often subject to heavy sediment and nutrient loads. Heavy sedimentation means that most of the lakes have to be dredged on a regular basis in order to maintain pond or lake depth. Heavy nutrient loads result in large algal and plant blooms over the warmer months of the year.

Reston has several large lakes (Lake Newport, Lake Anne, Lake Thoreau, and Lake Audubon) which are managed by the Reston Association and have been monitored for algae growth and sedimentation since 1981. The invasive weed hydrilla has become a severe problem in Lakes Audubon and Newport and management initiatives have been initiated. Also, waterfowl management initiatives have begun in an effort to curb the large Canada Goose population on the Reston lakes.

1. Monitoring and Results

The lakes are monitored for Dissolved Oxygen, temperature, pH total phosphorus, clarity, chlorophyll (the green pigment found in algae), and the presence of plankton

(small unicellular organisms found in the upper surfaces of waters.). The 2001 monitoring was conducted by Aquatic Environment Consultants. Rainfall in May of 2001 was over five inches and may have contributed to high phosphorus loads which, in turn, increased the algal blooms on some of the lakes during the summer. Most of these lakes have large surface algae populations and therefore lower water clarity during summer and early fall. This classifies them as eutrophic, a term which comes from the Greek for "well nourished" and is most probably an indicator of the high nutrient, most specifically phosphorus, levels in the lakes.

a. Lake Anne

Dissolved Oxygen levels were improved over previous years. The aeration system remained functional throughout the summer and is credited with the DO improvement. The temperature profile of Lake Anne was not as affected by ambient temperatures as it has been in the past. The average lake temperature for 2001 was 23.1 ^{o}C, which is 4.1 ^{o}C above the long term average of 19.0 ^{o}C. The whole-lake pH levels were above the long-term mean. Blooms of green and blue-green algae occurred throughout the season. Reduced water clarity resulted. The largest green algal bloom ever sampled occurred in July. This resulted in high biomass (evidence of unicellular organisms present in the water) readings throughout the summer.

b. Lake Audubon

The temperature/dissolved oxygen profile for Lake Audubon showed stratification after April. (Different "layers" of water had different DO and temperature readings). Water temperatures were similar to long-term averages. The pH levels were all above the long-term averages. The yellow–brown algae dominated the cooler waters in April and dropped in numbers to be replaced by blue-green algae and other algae as water temperature rose. There was a blue-green algae bloom in July. Biomass peaked in August, higher than the low values of 1999.

c. Lake Thoreau

Dissolved oxygen levels in certain "layers" of the lake decreased during summer months but overall the DO levels were up in 2001. The numbers of algae present were the lowest of any of the lakes in Reston. Blue-green algae and green algae were most prevalent from July to September. Overall algal presence was high and biomass was the second highest ever reported.

d. Lake Newport

Water temperatures were similar to the long-term averages. Thermal stratification was present throughout the season. This lake had the highest oxygen depletion of any of the lakes but it was not as severe as other years. Algal density was the highest on record. Blue-green and green algae were the most abundant types.

There was a extremely large blue-green algae bloom in July. The populations of all algal groups, especially the blue-greens contributed in 2001 to the highest density and second highest biomass since 1992. Seasonal density was over three times the long term averages and biomass was over twice the respective average.

e. Pohick Watershed Lakes

The six Pohick watershed lakes (Barton, Braddock, Huntsman, Mercer, Royal and Woodglen) are inspected annually for dam structure but are not monitored for biological or chemical parameters.

f. Lake Barcroft

The Lake Barcroft Watershed Improvement District (WID) is a local taxing district authorized by Virginia Law for conservation purposes. In 1999, Lake Barcroft had about 15,000 cubic yards of dredge spoil from the lake to dispose of. In order to avoid the costs associated with hauling it to a landfill, they rented a huge topsoil screening machine and excavator to load it, converting the waste material into topsoil by filtering out all the sticks, stones, beverage cans and other debris. The topsoil was then made available to local residents for a modest delivery fee. Some innovative BMPs (Best Management Practices), such as flow regulators, check dams, a diversion debris trap, a stormwater injection pit and street sweeping program have been implemented by the WID. These BMPs are being studied for both their capacity to reduce pollution and improving water quality in the lake and its tributaries, possibly leading to Countywide implementation. The WID also has a program to purchase and distribute high quality lawn fertilizer in 50-pound bags, which has been formulated without phosphorus and sell it to homeowners.

g. Lake Accotink

Lake Accotink is owned and managed by the Fairfax County Park Authority. County government has authorized the expenditure of $6,000,000 to dredge and remove 200,000 cubic yards of sediment from the lake. The Fairfax County Park Authority provides a boat and operator to the Fairfax County Health Department, which conducts water quality tests from four surface points from May through August. Results from the sampling were within the required limits as mentioned in the Health Department Stream Report.

h. Other ponds and lakes

There are other significantly sized lakes within the County. Many are centered within developments and have dwellings built along the banks of the lakes. There are numerous smaller ponds throughout the County that are found within communities, commercial developments or on farm properties.. Some are associated with golf courses and many serve as stormwater management ponds.

E. STORMWATER MANAGEMENT

1. Status of Stormwater Utility (Environmental Stormwater Utility) Concept in Fairfax County

In December of 1998, a draft report by the Stormwater Utility Advisory Group (SUAG) to the Board of Supervisors was circulated for review. The report addressed several issues relating to the implementation of a stormwater service charge program for Fairfax County. Activities were suspended leading up to the fall 1999 Board of Supervisors elections. DPWES is evaluating the need to conduct a more comprehensive public information campaign to articulate need and gain wider public support. During the summer of 1999, the firm of Camp, Dresser and McKee (CDM) was requested to develop a concept paper/report on framing significant aspects of the County's existing stormwater control program and present ideas and recommendations on the essential elements of future stormwater program. CDM submitted a draft report in December of 1999. A final edition was completed by March 2000. Work on public outreach is proceeding but any further action awaits full funding and the implementation of the stormwater utility fee program by the County.

2. Status of NPDES Requirements

The National Pollutant Discharge Elimination System (NPDES) Municipal Separate Stormwater Permit (MS4), a five year permit, was reissued by the Virginia Department of Environmental Quality (DEQ) in January 2002. Total Maximum Daily Loads (TMDLs) are tied into the new permit. The Stormwater and Planning Division and the Maintenance and Stormwater Management Division incorporated into the new permit a more comprehensive stormwater management program. This program includes the comprehensive Watershed Management Planning effort and long term biological monitoring, infrastructure mapping, inspections and maintenance, retrofitting developed areas with water quality control facilities and a more rigorous public outreach and education. The Maintenance and Stormwater Management Division of DPWES will perform inspection of privately owned stormwater management facilities on a regular basis (every five years). Water quality will be monitored at six storm sewer outfalls four times a year (seasonally), and 100 outfalls per year will be monitored during dry weather to determine the presence of illicit discharges.

During 2001, the County continued to evaluate BMPs (best management practices), undertook several stream restoration projects, continued with the monitoring of the six wet weather and 101 dry weather outfalls, and inspected 1,224 stormwater control facilities.

In March 2001, the 2000 Annual MS4 (Municipal Separate Storm Sewer System) Report was submitted and accepted by the Virginia Department of Environmental Quality.

3. Regional Stormwater Management Program

a. Background

Since the early 1980s, the County's *Public Facilities Manual* (PFM) has included a provision that encourages the concept of regional stormwater management. As opportunities arose, major developers as well as County staff pursued regional stormwater management primarily through the development process. An overall plan identifying the most appropriate locations for regional facilities was needed to improve this process.

In January 1989, the Board of Supervisors adopted a plan prepared by the engineering firm of Camp, Dresser and McKee. The plan, intended to be a pilot program, consists of a network of 134 detention facilities that will directly control 35 square miles of drainage area. To date, over 46 regional ponds in the Regional Stormwater Management Plan have been constructed. Currently there are 28 facilities in various stages of implementation. Eighteen potential facilities are in the final design phase either as County managed projects or via developers through rezoning. Five regional pond facilities are currently in the bonding or construction phase.

This Stormwater Management Plan is currently being re-evaluated by an ad hoc committee within the Department of Public Works and Environmental Services and it is expected that recommendations concerning the program will be made in late 2002.

b. Creation of new Stormwater Planning Division (SWPD)

Created in February 2000 by the Director of DPWES after approval by the Board of Supervisors, this new division is to review current countywide policies affecting the ecosystem and stormwater management issues. The mission of the SWPD is to promote policies to improve and protect the quality of life and support the environmental goals of the County.

c. Changes in County Mowing Policy at Stormwater Management Ponds

During the summer of 2000, in support of the interim tree policy adopted by the Board of Supervisors in 1999, the county revised the pond-mowing program. The interim tree policy provides opportunities for planting trees beyond the areas currently allowed under the Public Facilities Manual. The mowing program reduces the area mowed in and around a stormwater management pond by an average of 60% per pond. This program has resulted in the planting of 30 ponds, with additional 10-15 pond plantings slated for 2002.

4. Other Stormwater Ponds in Fairfax County

Fairfax County has various types of stormwater treatment facilities. Dry ponds fill up with water during a storm but return to a "dry" state within a few hours or a few days depending on its functional requirements. Of the total 1,279 dry ponds in the County, 893 are maintained by Fairfax County and 386 are privately maintained. Wet ponds have a permanent pool of water. Of the total 329 wet ponds in the County, 16 are maintained by the County and 313 are privately maintained. A total of 325 sites were inspected during 2001.

5. Infill and Residential Development Study

The combination of development patterns in the County and a growing concern over water quality issues led to the May 1999 request from the Board of Supervisors for the "Infill and Residential Development Study". The study was completed in 2000 and released to the public. The Board of Supervisors accepted the final recommendations at a public hearing January 22, 2001. The Study staff have reviewed the effectiveness of current policies regarding erosion control and storm drainage with the dual goal of minimizing any impacts of stormwater runoff from a proposed development on downstream property and limiting the impacts of stormwater management facilities on a neighborhood. Recommendations include:

1) Enhanced erosion and sediment control program, including the revoking of land disturbing permits during egregious violations.
2) Allow the use of chemical erosion prevention products, and bonded fiber matrix on highly sensitive soils or on steep slopes
3) Adoption of innovative BMPs,
4) Amend the Public Facility Manual to include Super Silt Fence requirements, Storm Drain Inlet Protection Devices, Faircloth Skimmers
5) Improved requirements for early review of stormwater management facilities as part of the rezoning process
6) Improved requirements for evaluating the adequacy of stream channels for increased runoff due to new developments
7). Development of a BMP monitoring program
8). Enhance education programs for citizens, staff and industry regarding E&S control.

Actions to date to fulfill the recommendations include:

1) Issuance of a letter to industry on October 10, 2001 that provided guidelines for designs of bioretention facilities and requirements for innovative BMP practices.
2) A pilot program for retrofitting stormwater detention ponds in older areas was initiated on July 1, 2002
3) Study concerning the impact of extended detention of the 1 year storm was started in January, 2002.

F. NONPOINT SOURCE POLLUTION PROGRAMS

1. Chesapeake Bay Program and Agreements

The Chesapeake Bay Program (CBP) is a cooperative arrangement among three states (Virginia, Pennsylvania, and Maryland), the District of Columbia, and the Federal government (represented by the Environmental Protection Agency) for addressing the protection and restoration of the water quality, habitats, and living resources of the Chesapeake Bay and its tributaries. These commitments are not legally binding. Each state determines how it will meet the various commitments and the approaches to implementation often vary greatly among states. All streams in Fairfax County are tributaries of the Potomac River, which flows into the Chesapeake Bay. Three Chesapeake Bay Agreements have been signed, focusing on reducing pollutants in the Bay and its tributaries.

2. The Virginia Chesapeake Bay Preservation Act and Regulations

The Virginia Chesapeake Bay Preservation Act was passes as part of Virginia's commitment to the second Chesapeake Bay Agreement goals to reduce non-point source phosphorus and nitrogen entering the Bay. Pursuant to the requirements of the Chesapeake Bay Preservation Act and Regulations, the Chesapeake Bay Local Assistance Department (CBLAD) and the Chesapeake Bay Local Assistance Board (CBLAB) have reviewed Fairfax County's Comprehensive Plan for consistency with the Act and Regulations.

On March 19, 2001 the Chesapeake Bay Local Assistance Board determined that Fairfax County's Phase II program is consistent, with conditions, with the Chesapeake Bay Preservation Act and Regulations. The County has until December 31, 2003 to address the four consistency recommendations: 1) map of the County's Chesapeake Bay Preservation Area components, 2) a shoreline erosion inventory and implementation strategies for use by the Wetlands Board in approving shoreline erosion structures, 3) inventory and development of plan for public waterfront access, and 4) develop policies that address the recommendations for water quality as discussed in the "Infill and Residential Development Study".

The agricultural portion of the Chesapeake Bay Preservation Ordinance requires landowners with land in agricultural uses to have conservation plans. The Northern Virginia Soil and Water Conservation District (NVSWCD) prepares soil and water quality conservation plans and provides technical assistance in the implementation of approved plans. NVSWCD has written plans for all Agricultural and Forestal Districts that have Resource Protection Areas within their limits. Currently, NVSWCD is working extensively with horse owners and keepers, since a large percentage of agricultural land use in Fairfax County is related to horse operations. These operations

require innovative land management and careful nutrient management to prevent and reduce pollution in runoff to nearby streams. In 2001, 33 soil and water quality conservation plans were developed for 465 acres and included 10,805 linear feet of vegetated buffers in RPAs. Cumulatively, 8,594 acres and 223,813 linear feet of RPAs are covered by conservation plans developed since 1994 when the program began. County regulations require conservation plans for establishing and renewing Agricultural and Forestal Districts. There are approximately 40 such districts in the County. NVSWCD also develops conservation plans for landowners receiving state cost-share money for installing agricultural BMPs, such as manure storage and composting structures or fencing animals out of streams. NVSWCD continues to distribute a brochure it developed for Fairfax County horse-keepers: *Agricultural Best Management Practices for Horse Operations in Suburban Communities*.

3. Erosion and Sedimentation Control and Enforcement-Fairfax County Department of Public Works and Environmental Services

DPWES is planning the implementation of organizational improvements to the Environmental and Facilities Inspection Division (EFID, formerly the Site Inspection Branch) that will result in a greater emphasis and a higher quality of inspection services associated with erosion and sediment control. They will be developing a new quality assurance program and will be training Field Specialists (a newly established position). Field Specialists will be responsible for resolving all erosion and sediment control violations. DPWES will be developing a prioritized inspection program, in accordance with guidelines established by the Virginia Department of Conservation and Recreation, that will consider slope, soil type, proximity to streams, and extents of buffer areas to determine an overall rating for any given site. These proposed resource requirements and organizational improvements are being led by the County's Environmental Coordinator.

a. Inspections

In 2001, the EFID recorded an average of 1,055 Erosion and Sediment (E&S) control inspections per month. They also issued 30.83 Notice of Violations per month for violations of Chapter 104 of the *Fairfax County Code*.

b. Lake Martin

Litigation against two of the upstream developers for off-site damages associated with land development activities has commenced and trial dates have been scheduled. In addition the County has engaged the services of a consultant to prepare a plan to remove 6100 cubic yards of sediment from Lake Martin. Additionally plans to retrofit two upstream existing stormwater management ponds to protect stream channels that drain into Lake Martin have been drafted.

4. Occoquan Basin Nonpoint Pollution Management Program

The Northern Virginia Regional Commission continued in its role as staff to the Occoquan Basin Nonpoint Pollution Management Program. The program was established in 1982 to provide an institutional framework for maintaining acceptable levels of water quality in the Occoquan Reservoir, one of the two major sources for of drinking water for much of Northern Virginia. With the release of the 2000 Census data, staff determined that were approximately 363,000 people residing in the Occoquan watershed as of the year 2000. This represents a four-fold increase in population from when statistics were first collected in 1977. The Occoquan Program has initiated an update to its 1992 Northern Virginia BMP (Best Management Practice Handbook). The main emphasis will be on the inclusion of previously innovative, but now accepted techniques such as rain gardens and some non-structural BMP techniques with demonstrated removal efficiencies.

a. Modeling

In October 2001, the Occoquan Policy Board and Technical Advisory Committee approved a fundamental change in the management structure for the Occoquan Model. A standing Modeling Subcommittee has been created to oversee the model development which will be handled by Occoquan Watershed Monitoring Laboratory. The result will be a state-of-art model that will be able to take quick advantage of advances in modeling technology.

b. Storm Drain Marker Program

NVRC, along with the four local governments that share the watershed, have launched a program designed to place more than 1,100 colorful durable vinyl markers on storm drains. These markers will alert citizens of the potential harm from dumping. Also NVRC has developed door hangers, in English and Spanish, informing citizens of the program and providing telephone numbers.

5. Soil and Water Conservation Technical Assistance

In calendar year 2001, the Northern Virginia Soil and Water Conservation District (NVSWCD):

- Reviewed and commented to DPWES on the erosion and sediment controls, water quality protection, and stormwater management aspects of 61 site development plans in the Pohick Creek Watershed and within three miles of the Potomac River. NVSWCD also reviews DPWES, Fairfax County Park Authority (FCPA), School Board projects and any other plans, as requested, which appear to have particular difficulties involving soil types and slopes.
- Reviewed and commented to the Department of Planning and Zoning (DPZ) on 219 rezoning and special exception applications, with particular attention to the properties of soils, the potential for erosion, the impact on drainage, stormwater management, and the surrounding land uses and environment.

- Provided information about soils to 179 consultants, engineers, developers, and realtors, and citizens.
- Provided land management assistance to individual homeowners and homeowner associations via 469 phone calls, email or office visits, and 98 site visits. Solutions were recommended for drainage, erosion, and other natural resource problems.
- Provided technical advice to 57 pond owners.
- Provided design and installation expertise for two stream stabilization projects. One, below Lake Accotink, was done in partnership with DPWES, FCPA, and the Virginia Department of Forestry (VDOF) and in conjunction with a three-day workshop which also included a day of stream measurements. The other, on Wolf Trap Run, was done in partnership with DPWES, VDOF, and the local community.
- Designed three SWM pond retrofits for DPWES in order to provide extended detention, greater water quality improvement, and a more aesthetically pleasing and ecologically balanced environment.

a. Workshops

NVSWCD and VDOF held an intensive three-day workshop in the fall of 2001 on stream stabilization, stream classification, measurement and restoration. There were 40 participants from various local and state agencies.

In September 2001, DPZ, DPWES, and NVSWCD, in conjunction with the Center for Watershed Protection, sponsored a workshop for 95 staff on watershed management for suburban watersheds. Topics included better site design techniques, innovative stormwater management measures, stream protection, and watershed planning.

b. Backyard to Bay Program

NVSWCD created and distributes the *Citizens Water Quality Handbook*, a practical guide to water quality, that contains chapters on watersheds, water conservation, nonpoint source pollution, stream management, wetlands protection, water quality monitoring, environmentally friendly lawn care, specific suggestions for "making a difference," and a listing of agencies and organizations that provide services, information, and help related to water quality. *Don't Dump Oil*, a Spanish language brochure, explains that dumping used oil into storm drains is not only illegal, but can harm people and the environment.

c. Publication of "*Maintaining BMP's- A Guidebook for Private Owners and Operators in Northern Virginia*

Published in February, 2000 by the Northern Virginia Regional Commission, the guidebook specifically targets homeowners/civic associations and small businesses that may have responsibility for BMP maintenance. The guidebook addresses

simple maintenance tasks, how to plan for long-term BMP maintenance costs, and where to go for additional information.

6. Stream Valley Reforestation

In 2001, the Virginia Department of Forestry partnered with volunteers from various organizations such as the Chesapeake Bay Foundation, Difficult Run Conservancy, the Potomac Conservancy, 4-H Clubs, and Nextel Corporation to plant 1,700 seedlings in riparian zones located in stream valleys throughout Fairfax County.

7. Stream Bank and Other Stabilization Projects

a. Wolf Trap Run and Accotink Watershed

Two stream bank stabilization projects are being sponsored by Fairfax County Department of Public Works Stormwater Management Division, the Northern Virginia Soil and Water Conservation District, and the Virginia Department of Forestry. In February 2001, NVSWCD and DPWES jointly designed and implemented a 150 foot segment of Wolftrap Run at Cinnamon Creek. The purposes of the projects are the protection of infrastructure (trails) and sediment reduction.

b. Old Farm Pond at Mason District Park Reconstruction and Turkeycock Run Project

The Fairfax County Park Authority initiated reconstruction of an old farm pond at Mason District Park, which will replace the existing dam, install new structures, install an overlook at the pool edge and create a wetland area with boardwalk access. Stream reaches of Turkeycock Run below the pond have been adversely affected and the increase in pool surface will create stormwater runoff protection for those stream segments.

FCPA is also planning a restoration of Turkeycock Run that will begin in 2003 as the Mason District Pond restoration is completed.

c. Hidden Pond Park Stream Retrofit

The Fairfax County Park Authority will add BMP (Best Management Practice) controls to an existing facility upstream of the park to protect the portions of the stream above the pond, allow for restoration of stream health, and reduce sedimentation in the pond.

d. Huntley Meadows Park - Dogue Creek and Barnyard Run

The Fairfax County Park Authority and the Department of Public Works and Environmental Services are working on a bond project that would protect the stream reaches of Barnyard Run and Dogue Creek above Huntley Meadows Park.

8. Septic Permitting and Repairs

Improperly built and maintained septic systems can often be a source of pollution to surface and ground waters. Approximately 30,000 homes and business are served by septic tank systems in Fairfax County. There were 412 new septic systems constructed in 2001. There were 899 Septic Tank Repair Permits issued in 2001. Repairs ranged from total replacement of the system to minor repairs such as broken piping. There were 824 Septic Repair Permit Approvals in 2001. Areas of marginal or highly variable soil remain a concern for future failing septic systems. Fairfax County currently has no enforced septic system inspection requirements.

G. WATER POLLUTION ENFORCEMENT ACTIONS

1. Virginia Department of Environmental Quality (DEQ)

DEQ reports that it had 68 Underground Storage Tank cases and 236 Pollution Response cases in Fairfax County in 2000. We have no summary data for 2001.

H. PERENNIAL STREAM MAPPING PROJECT

A project to field identify perennial streams was initiated in early 2002 in response to Fairfax County Board of Supervisors' direction. This action was taken, at least in part, as a result of an Environmental Quality Advisory Council (EQAC) resolution relating to the mapping and protection of additional stream segments under the County's Chesapeake Bay Preservation Ordinance. Funding was approved on September 10, 2001. During the fall of 2001, staff developed a draft protocol for field identifying the boundaries between intermittent and perennial streams. Fieldwork is expected to be completed by December 2003.

I. WATERHED PLANNING AND MANAGEMENT

1. Countywide Watershed Planning

The Fairfax County Department of Public Works Stormwater Planning Division of DPWES has commenced a 5 to 7 year watershed planning program to develop new management plans for all 30 County watersheds. The current master drainage plans

were developed for the County in the mid 1970's. Consultants have been selected for the stream physical assessment tasks for the development of the watershed managements plans. The first phase of the watershed planning effort, which covers 60% of the County, consists of the watersheds identified in Table I-3.

Table I-3

Watersheds Included in the First Phase of the Watershed Master Planning Initiative

Project Sequence	Watershed	Size (square miles)
1	Little Hunting Creek	11
2	Cub Run	42
3	Cameron Run	33
4	Horsepen Creek	10
5	Difficult Run	58
6	Popes Head Creek	19
7	Nichol Run	8
8	Pond Branch	8
9	Pohick Creek	36
10	Sugarland Run	14
	Total	239

Source: Department of Public Works and Environmental Services

Upon completion of the first phase, the remaining watersheds will be evaluated to determine a sequence for the rest of the County. The first Stakeholder and Public Involvement Meeting was held October 3, 2001. A review of the Watershed Planning Process was presented with time for citizen input and group discussions at the end. Those comments were considered as the County began its Watershed Planning.

2. Reston Watershed Plan

The Reston Association Board of Directors authorized the development of a Watershed Management Plan and establishment of a stakeholders group (the Reston Association Watershed Action Group, or ResWAG). Work on the project was initiated in 2001 and will be completed mid-2002. Work is being done by the environmental firm GKY and Associates.

3. Northern Virginia Regional Commission Occoquan Program Watershed Planning

Recognizing the significance of the Occoquan Reservoir as source of drinking water, the Occoquan Policy Board and Technical Advisory Committee have approved the development of a watershed-wide management plan. The intent is not to duplicate efforts already taking place in local jurisdictions but to coordinate and strengthen existing components and to fill in gaps where appropriate. This is anticipated to be a two year effort and will involve Fairfax County.

J. GROUNDWATER ASSESSMENT

The United States Geological Survey (USGS) maintains a series of wells throughout the nation to monitor groundwater levels and drought. Two are located in Virginia ; one such well (Site 385638077220101) in Fairfax County has been maintained since 1976. This well provides continuous real-time data that is used by the USGS to assess ground water levels. You can find the information on this well by going to http://groundwaterwatch.usgs.gov.

Neither the Fairfax County government nor the Virginia Department of Environmental Quality monitors groundwater for water quality or water levels in Fairfax County.

K. DRINKING WATER SUPPLY

The County's water supply comes from the Potomac River, the Occoquan Reservoir, Goose Creek, community wells, and private wells. The Fairfax County Water Authority (FCWA) also provides drinking water to the Prince William County Service Authority, Loudoun County Sanitation Authority, Virginia America Water Company (City of Alexandria and Dale City), Town of Herndon, Fort Belvoir, Dulles Airport, and Lorton Correctional Institution.

With the exception of some wells, prior to use the water must be treated. The County's water use increased to 49.55 billion gallons in 2000. Table I-4 presents the 2001 sources of the County's water supply.

Table I-4
Sources of Fairfax County's Water Supply, 2001

Sources	Gallons (in billions)
Occoquan Reservoir (Lorton/Occoquan)	21.60
Potomac (Corbalis)	27.86
Wells	0.03
Purchased	0.06
TOTAL	49.55

Source: Fairfax County Water Authority

1. Wells

a. Fairfax County Water Authority and Public Wells

In 2001, the five (5) FCWA wells and their two (2) distribution systems were monitored monthly for bacteriological quality and annually for Volatile Organic Compounds (VOCs). In addition, the wells were tested semiannually for metals, nutrients, solids, odors, color, pH, alkalinity, and turbidity. During 2001, Three of the six wells exceeded the Secondary Maximum Contaminant Level (SMCL) for odor and two for iron. These are non-enforceable limits relating to the aesthetic quality of drinking water.

During quarterly monitoring in 2001, four (4) wells showed trace levels of VOCs. The monitoring results on wells met the Virginia Department of Health Water Works Regulations.

Lead and Copper monitoring in accordance with EPA and VDH Waterworks Regulation was performed on both distribution systems in 2001. The system met all EPA Lead and Copper regulatory requirements.

b. Private Wells

There are approximately 12,000 single-family residences that are served by individual well water supplies in Fairfax County. In 2001, 226 New Well Permits were issued for single family residences and 75 for non-community well water supplies. There were 261 Well Abandonments (wells closed) in 2001.

2. Lorton and Corbalis Systems Monitoring Results and Reports

a. Trihalomethanes, Chloramines, and other By-products of Water Treatment

Trihalomethanes are by-products of chlorination water treatment and are thought to be carcinogenic**.**

b. Trihalomethanes (THM) Monitoring Project

The 2001 distribution system running quarterly averages were below the Maximum Contaminant Levels (MCL) for total trihalomethanes (TTHM) of 100 µg/l. The 2001 running quarterly averages for TTHMs were 23 µg/l and 44 µg/l for the Corbalis and Lorton distribution systems, respectively.

c. Disinfectant/Disinfection By-products (D/DB-P) Rule

EPA has promulgated Stage 1 of the D/DB-P Rule, which lowers the total THM MCL from 100 µg/l to 80 µg/l. This rule took effect in January of 2002 (TTHM - Total Haloacetic Acids, Bromate, and Chlorite and the Disinfectants, Chlorine,

Chloramine, and Chlorine Dioxide). In addition, the disinfection by-product Haloacetic Acid (HAA) will be regulated a level of 60 µg/l. Preliminary testing indicates that FCWA will be able to meet these guidelines. The rule also sets a Maximum Residual Disinfectant Level (MRDL) for chlorine of 4 µg/l**.** FCWA is presently testing for these chemicals in the water treatment systems. To obtain lower TTHM (total THM) concentrations, the new facilities for ozonation are being constructed at the Corbalis and Lorton facility.

Stage 2 (Long Term) is scheduled by EPA to be finalized by July 2003 and will regulate THMs and HAAs based on locational running average, monitoring and compliance requirements, and enhanced coagulation.

d. Heavy Metals

FCWA tests drinking water quarterly for Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Lead, Magnesium, Mercury, Nickel, Potassium, Selenium, Silver, Thallium and Zinc and on a monthly basis for Iron, Manganese and Sodium. The levels of these metals continue to be below their MCL or SMCL. FCWA has reported that "the concentration levels for the unregulated metals were within an expected range."

e. Enhanced Surface Water Treatment Rule (ESWTR)

The ESWTR assumes revisions to the current Surface Water Treatment Rule may be necessary to provide additional protection from pathogenic organisms. The fist step toward developing the ESWTR was the microbiological monitoring required under the Information Collection Rule. The first year of the data has been used to develop requirements for the interim ESWTR. The long-term ESWTR will be based on additional data collection and refinement. The proposed ESWTR will provide for a sanitary survey of the entire system, a maximum contaminant level goal for cryptosporidium of zero, and treatment requirement alternatives.

f. Other Monitoring Programs

FCWA monitored 3,307 distribution taps for total coliform in 2001. Each months compliance report was within the regulatory limits for the Virginia Department of Health and the EPA's Total Coliform Rule.

During 2001, the FCWA Laboratory monitored the surface waters and finished drinking water for 42 Volatile Organic Compounds (VOC) and 39 Synthetic Organic Compounds (SOC). No VOCs were detected in source waters except for trace amounts of MTBE (Methyl tertiary butyl ether). In some parts of the U.S., MTBE has been detectable in high amounts in source waters. In 2001, monitoring of the FCWA well systems has resulted in non-detectable levels, and surface system monitoring has shown only trace amounts in the raw and unfinished waters. The only VOCs detected in the finished water systems were TTHMs and trace amounts

of MTBE**.** The few SOCs that were detected were detected in both the finished and source waters and were at trace levels significantly below the Maximum Contaminant Loads (MCLs)

g. Residuals Disposal

Residuals occur as the result of heavy sediment loads entering the freshwater intakes and having to be removed from the water prior to treatment. Residuals generated at Corbalis are presently being applied by contract to agricultural lands in Maryland and Virginia. The FCWA is studying the possible use of polymers in lieu of lime in the dewatering process. If polymer condition dewatering becomes feasible, the solids volume for disposal may decrease.

h. Consumer Confidence Reports

Federal regulations require water suppliers to provide annual reports on the quality of the drinking water to their customers through the Consumer Confidence Report (CCR) Rule. FCWA customers received their first annual CCR in the summer of 1999. The 2001 CCR is available for review on the FCWA website at **http://www.fcwa.org.**

3. Source Water Assessments

The 1996 Amendments to the Safe Drinking Water Act (SDWA) provided for source water assessment and protection programs designed to build a prevention barrier to drinking water contamination. Under SDWA, states are required to develop comprehensive Source Water Assessment Programs that identify the areas which supply public tap water, inventory contaminants, and assess water system susceptibility to contamination. FCWA, through a grant from the Virginia Department of Health, has completed an inventory of potential sources of contamination and a survey of land use activities within the Potomac and Occoquan Watersheds. The Virginia Department of Health is currently reviewing the complete Source Water Assessment and is expected, based on information provided through the grant study, to make a determination of susceptibility to contamination in 2002.

4. Facilities Management

a. New Treatment Plant in Lorton

FCWA is building a new state-of–the–art 129 mgd (million gallons per day) water treatment plants, expandable to 160-mgd; to replace the existing Lorton and Occoquan treatment plants in Lorton. In addition to flocculation and sedimentation, the Griffith Water Treatment Plant will include advanced treatment

processes of ozone disinfection and biologically active, deep bed, GAC (granular activated carbon) filtration. Construction of the plant began in the Spring of 2000 and was approximately 47% completed as of April, 2002. The plant is scheduled for completion in January, 2004. The Raw Water Pumping Station associated with the new plant will also have a capacity of 120 mgd and be expandable to 160 mgd**.** The raw water facilities project is approximately 80% complete and is scheduled for completion in January 2004.

5. Regional Cooperative Water Supply Agreements

In order to protect the ecosystem of the Potomac River during low flow periods, the three major water utilities in the Metropolitan Washington area have signed water allocation agreements for water use during these low flow periods. Two upstream dams, Jennings-Randolph on the Potomac River and the Savage River Dam, along with Seneca Lake in Montgomery County, Maryland, are storage facilities for drinking water supplies during low flow periods. While the Potomac River has flows that average above 7,000 million gallons a day, the river has often reached flows well below that, usually in late summer and early fall. The lowest recorded flow in this region was 388 mgd at Little Falls in September during the drought of 1966. In 1981, the three major metropolitan water utilities, including the Fairfax County Water Authority, signed the Low Flow Agreement, which requires that there be a minimum flow of 100 million gallons a day in the Potomac.

a. Interstate Commission on the Potomac River Basin (ICPRB) Cooperative Water Supply Operations (CO-OP)

The ICPRB plays several important roles in providing for the region's current and future water supply needs. The CO-OP Section facilitates the agreement among the three major water utilities (Fairfax County Water Authority is one) that require water suppliers to share resources during times of low flows in the Potomac River. The Water Resources Section also provides technical water resources management assistance to the jurisdictions throughout the basin. There were no releases of water from any storage facilities for drinking water purposes in 2001. The lowest flow for 2001 for the Potomac River at Little Falls was 530 mgd on November 9.

b. Metropolitan Washington Area Council of Governments (COG) Water Supply and Drought Awareness Plan.

In response to the droughts of 1998 and 1999, COG brought together a task force in May 2000 to coordinate regional responses during droughts to reduced availability of drinking water supplies. The plan consists of two components (1) a year round plan emphasizing wise water use and conservation and (2) a water supply and drought awareness and response plan. The Interstate Commission on the Potomac River Basin handles the administration of the coordinated drought response for water withdrawals from the Potomac River and during low flows. Additionally the

CO-OP sections works with COG and the Drought Coordination Committee to assist in providing accurate and timely information to basin residents during low-flow conditions in the Potomac.

L. NEW LAWS OR REGULATIONS

1. Amendments to the Chesapeake Bay Regulations

The Chesapeake Bay Local Assistance Board amended the Chesapeake Bay Preservation Area Designation and Management Regulations on December 10, 2001. While most of the basic tenets of the Regulations remain the same, there are some significant changes. The Resource Protection Area (RPA) buffers now apply to "water bodies with perennial flow" rather than "tributary streams". This means that a site-specific determination of perenniality needs to be determined, even if an RPA is not shown on the County's Chesapeake Bay Preservation Area map. This will result in an increase in the extent of Resource Protection Areas in Northern Virginia. The Northern Virginia Regional Commission hosted a workshop on the new amendments and implementation on February 21, 2002.

M. SUMMARY

Fairfax County streams and watersheds continue to be impacted by four basic problems. First is the failure of comprehensive land use planning and site design over time to adequately incorporate watershed and stream protection requirements into their decisions and to consider the cumulative effects of land use decisions on Fairfax County's streams. Secondly, at times, high levels of fecal coliform bacteria occur in specific streams throughout the County. Thirdly, stormwater runoff and erosion continue to be the largest problems within Fairfax County streams. Most Fairfax County streams have increased runoff flows that exceed the capacity of their stream channels. This has created an ongoing erosion cycle that includes eroding stream banks, heavy sediment loads, and sedimented stream bottoms. This erosion cycle persists for years, if not decades, until the stream channel widens to accommodate the flow. This has resulted in erosion problems throughout the County on trail systems, homeowners' backyards, business' landscapes, and transportation infrastructure such as bridge abutments. In addition, these ongoing erosion patterns have resulted in numerous large and small ponds and lakes throughout the County having enormous sediment deposition, which then requires frequent maintenance and dredging to maintain depth. Sediment on stream bottoms results in reduced habitat and diversity, and compromises food webs within watersheds. Sediment also compromises the quality of, and increases the expense of, treating the drinking water within the Occoquan Reservoir. Poor land use planning, inadequate enforcement of soil and erosion laws, and inadequate stormwater management in past years has significantly contributed to these

erosion problems. Only a few streams, such as those in E. C. Lawrence Park, remain undisturbed and excellent examples of healthy streams in Fairfax County.

Lastly, there is no one component of the Fairfax County government responsible for the management and protection of the County's streams or environment. County stream assessment and protection have been parceled out to various agencies., Conflicting results have occurred as stormwater management strategies and policies have conflicted with waivers granted by other departments which often result in degraded stream habitat**.** However, as long as the rate of stream degradation surpasses stream protection and restoration efforts in Fairfax County streams, the trend will continue to be a downward one.

Some very positive steps have been taken in the past two years to address these chronic long term problems:

1) The reformation of the Environmental Coordinating Committee under the Deputy County Executive and the work and guidance of the Environmental Coordinator have done much to move towards more coordinated efforts.
2) The Fairfax Stream Protection Strategy Baseline Assessment in 2000, the amendment to the Policy Plan to address stream protection, passed in October 2000, and the stormwater management recommendations of the Infill and Residential Development Report in 2000 are significant first steps in addressing many of these issues.
3) The initiation and funding of the Watershed Management Planning efforts and the Perennial Stream Mapping Project in the Stormwater Management Division are important and necessary first steps in good watershed protection and management.

All of these efforts indicate a significant change in County policy and practice towards the protection and restoration of County streams.

N. RECOMMENDATIONS

1. EQAC strongly supports the implementation of a Comprehensive Countywide Watershed Management Program.

   Fairfax County's stream and other water resources are a legacy to preserve and protect for today's citizens and future generations. The well conceived and well–done countywide stream assessment report was released in January 2001. This underlying scientific examination of existing stream conditions is being and should continue to be used to create a well-coordinated and well-planned effort to establish priorities to protect, restore, and monitor changes to these resources using watershed and sub-watershed based strategies. EQAC strongly endorses the work of the county Board and staff in these efforts.

   Along with the new Stream Protection Strategy rankings and management recommendations, this program should also include:

a) Coordination of and ongoing assessments of existing watersheds, to include point and non-point sources, including amounts of impervious surface and vegetative cover;

b) Maintenance of inspection and maintenance of County BMPs at the highest level;

c) Provision of funding at a level that is adequate to create and implement a fully functional stream protection program;

d) The coordination of all relevant water quality and stream data and data analysis from all sources within the DPWES Stream Protection Strategy and Watershed Management Program; and

e) A process through which all waivers from County agencies that would affect water quantity or quality in Fairfax County streams must be reviewed and either accepted or denied by the stormwater management program responsible for watershed planning (i.e., the Stormwater Planning Division of the Department of Public Works and Environmental Services).

2. EQAC recommends the funding of the Stormwater Utility Program/Watershed Protection and Restoration Program.

   This program should include the following conditions:

   a) Equal importance devoted to environmental protection, restoration, and monitoring as compared to infrastructure improvement and maintenance; and

   b) Establishment of a Watershed Board to oversee such a program and to ensure that the above conditions are met.

   c) Implementation of this should follow the recommendations of the Forested Wetlands Committee, which includes a careful examination of each site to ensure that disturbances to wetlands and other unique environmental features are minimized. It should also include structures and practices that allow bioretention and recharge to aquatic systems, and other innovative practices.

3. EQAC recommends posting of affected County streams with a health warning for fecal coliform bacteria until such time that the problem of high fecal coliform bacteria levels in the County's waters is mitigated.

   County streams have continued to show high coliform counts. A Total Maximum Daily Load (TMDL) for coliform has been developed for Accotink Creek and Four Mile Run due to excessive coliform counts. The sources of the pollution hand have been identified and steps need to be taken to remediate the problem. Human coliform has been found to be present in significant amounts. Until such a time as remediation is made, EQAC recommends the posting of signs in County streams with high coliform counts and/or a

broad public information campaign that contains the following from the 1999 Health Department report: *"The use of streams for contact recreational purposes, such as swimming, wading, etc. which could cause the ingestion of stream water or possible contamination of an open wound by stream water, should be avoided".*

4. EQAC recommends selective monitoring on the efficiency of stormwater management ponds, other BMPs, and the effectiveness of required erosion and sediment control procedures and structures and enforcement regimes.

   While the overall reports, the Health Department Report, and the Stream Protection Strategy Baseline Study (DPWES), indicate that Fairfax County streams have degrees of degradation, the specific causes are unclear. In some cases such as Kingstowne, there is adequate monitoring and remediation, when required, has occurred. In other cases, such as Lake Martin, citizens were placed in the unfortunate position of having to monitor and document the degradation due to failed or inadequate stormwater management facilities and inadequate soil and erosion enforcement.

   We are, however, unclear as to which structures and requirements are effective and under which conditions these measures are working well in Fairfax County. The continued granting of stormwater management waivers would appear to further degrade streams in spite of claims to the contrary. However, there are no data to support either side of the argument other than the fact that streams continue to be degraded. Data should collected.

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CHAPTER II

AIR QUALITY

II. AIR QUALITY

A. ISSUES AND OVERVIEW

1. Introduction

Over the course of the past two years, the Environmental Quality Advisory Council has been attempting to discuss and bring focus to the "big-picture" problems and tradeoffs associated with the troubling efforts in the metropolitan area and particularly in Fairfax County to manage our now-chronic air quality non-attainment problems. Lest anyone might have forgotten how we got into this predicament, it should perhaps be recalled that the Clean Air Act ("CAA") was reauthorized in 1990 to deal, among other things, with the pervasive problem of ozone non-attainment. The air quality issue of concern in Fairfax County is in fact the same ground level ozone that was such a concern at the time the statute was reauthorized. Our problem results from a classic combination of urban sources of volatile organic compounds ("VOCs") (mostly from motor vehicles) and upwind sources of nitrogen oxides ("NOx"), which combine with VOCs to form ozone.

Aside from the health effects of ozone, which have been well documented, the problems that we face as a result of our chronic non-attainment are a direct result of the 1990 Clean Air Act Amendments ("CAAA"). Section 179 of the CAA addresses the consequences of chronic non-attainment by allowing the Environmental Protection Agency ("EPA") to impose highway sanctions or take other discretionary steps as a result of the failure to meet the State Implementation Planning ("SIP") requirements of the CAA. Further, under Section 176 of the CAA, the Federal Government is prohibited from supporting in any way, including the provision of financial assistance, any activity that does not conform to the SIP requirements of the CAA. As will be seen from our discussion below, the credibility of the SIP for Fairfax County and indeed for the entire metropolitan area is being called more and more into question.

Even though the Metropolitan Planning Organization ("MPO") apparently enjoys the sympathy, if perhaps not the full support, of the EPA, the DC area has now become the poster child for very difficult and troubling questions associated with local ozone non-attainment. Our new-found status results largely from the July decision of the U.S. Court of Appeals for the D.C. Circuit casting aside the EPA/Metropolitan Washington Council of Governments ("COG") decision that we could remain a serious non-attainment area based on projected ozone attainment tied to an extension of our attainment deadline from 1999 until 2005. As a result, the EPA is now required to bump the metropolitan area up to the status of a severe non-attainment area and address other short-comings identified by the Court. Notably, there appears to be some difference of opinion as what might actually be required to address the other short-comings.

While these circumstances apply to the entire metropolitan area, the overall air quality situation is based on a complex combination of weather patterns, transport of precursor pollutants from both inside and outside our area, as well as varying growth dynamics and automobile use patterns in differing regions within the metropolitan area. Among the local factors contributing to the problem, automobile usage tied to rapidly expanding urban growth is a particular problem. Without even understanding the complexities associated with air-quality management, the potential for regional and local one-upsmanship tied to the ever more difficult trade-offs between economic development tied to urban growth and the use of the automobile should be obvious.

The past two Annual Reports ("AREs") have discussed this situation in some detail and EQAC has recommended a two-pronged approach tied to a hoped-for core commitment on the part of the County to develop its own capability to systematically evaluate air quality compliance needs and address them more directly in the context of the many air quality-related management activities that occur within the County. For a variety of reasons, most of which one way or another relate to the slowness with which government reacts, little or no direct action has occurred. Meanwhile, EQAC has begun the process of interacting with the County's Environmental Coordinating Committee ("ECC"), the Planning Commission ("PC") and the Transportation Advisory Commission ("TAC") to discuss some of the issues associated with this difficult problem. The one thing that we can unhesitatingly conclude, just as we have in our past two AREs, is that the ongoing lack of key air quality planning capabilities in Fairfax County will continue to expose us not only to bad air but also to a more and more uncertain regulatory future.

a. NOx SIP Call

The so-called NOx SIP call is now moving forward as a result of the March, 2001 decision of the U.S. Supreme Court rejecting industry petitions and affirming the June, 2000 D.C. Court of Appeals decision upholding the SIP call. The history of this situation has been described in the previous two AREs. The implementation date of the SIP call in Northern Virginia as well as the rest of the Washington Metropolitan Area is 2003, while the implementation date for the rest of Virginia is 2004. The NOx SIP call addresses the issue of transport of NOx into our region and assumes that approximately 30% of our regional ozone non-attainment problem is caused by transport. The result is that in Fairfax County we should see somewhere in the neighborhood of a 20% reduction in NOx as a result of the SIP call. Although the results of the SIP call litigation should be good news for Fairfax County, the relevance of the potential benefits of the SIP call appears to be substantially overshadowed by the significant increase in the actual extent of ground level ozone exceedances. Nor do the results of the Sierra Club lawsuit, which is discussed below, help.

b. Confirmation of EPA Ozone Eight-Hour and Particulate Matter Standards

Our inability in Fairfax County, and indeed in the Metropolitan Washington area as a whole, to attain the ozone one-hour standard, combined with the February, 2001

U.S. Supreme Court decision upholding EPA's new ozone eight-hour and particulate matter standards, sets the stage for a troubling future in Fairfax County when it comes to ozone non-attainment. Although the status of our current SIP has been linked to attainment of the one-hour standard, air quality monitoring of the new eight-hour standard over the past several years leaves little doubt that the new standard will inevitably make air quality management activities in the County considerably more difficult. Currently, EPA is projecting the issuance of implementation guidance for the eight-hour standard in the fall of 2002.

In 2001, the County once again had exceedances of both the one-hour and eight-hour standard. Exceedances of the eight-hour standard in 2001 substantially exceeded those in 2000, which is particularly troubling given the results of the Sierra Club lawsuit. As the County moves away from the one-hour standard and toward the eight-hour standard, the direct implications of chronic non-attainment, especially of the eight-hour standard, will inevitably become a much more serious matter in Fairfax County. As if to underscore this situation, so far in 2002 there have already been eleven exceedances of the one-hour standard on five different days and 71 exceedances of the eight-hour standard on 25 different days in Fairfax County alone.

c. Phase II Attainment (Rate of Progress Planning) in Northern Virginia

The basic purpose of the Phase II Attainment Plan, which was to project a plan that could be successfully reflected in the SIP for Fairfax County, has now been completely sidetracked by the results of the Sierra Club lawsuit. At a minimum, it can be expected that Fairfax County and the entire Metropolitan Planning Area will now be bumped up from a serious to a severe non-attainment area. It can only be guessed what further actions will be taken by EPA, but at best, this new non-attainment designation will almost certainly carry with it specific planning requirements for measures to offset the use of mobile sources in Fairfax County. Meanwhile, the other missing components of SIP planning that were highlighted by the Court will also have to be addressed by EPA. A serious problem that will have to be considered is whether Rate of Progress ("ROP") Planning beyond Phase II will be required, since even in the face of projected attainment under the Phase II Plan, our actual air quality, as reflected in the exceedances measured by our ever-shrinking monitoring system, clearly demonstrates an increasing pattern of non-attainment.

At worst, further lawsuits and other lobbying efforts may be expected by the environmental community with the objective of stopping Fairfax County development linked to the utilization of federal transportation funding. Although EPA has not thus far questioned the credibility of SIP planning in such a way as to indicate a direct threat of sanctions under the CAA, there can be no certainty that the issue of sanctions will not be raised in the wake of the D.C. Court Decision. Meanwhile, even though the COG and EPA appear to be making a valiant effort to meet the conformity requirements of the Clean Air Act, we do not believe it is any longer credible to assume the legitimacy of the ROP planning measures that were

originally part of the Phase I and Phase II Attainment Plans in Fairfax County. Even if we are wrong on this point, our concerns about air quality planning capabilities in the County remain. The truly unfortunate part of all of this is that because of the past decisions made in the County to abdicate its air quality planning capability, the County has a relatively minor role in planning its own future under the existing scenario.

d. Earthjustice Legal Defense Fund (Sierra Club) Lawsuit

On July 2, 2002, the U.S. Court of Appeals for the D.C. Circuit issued a 13-page opinion unanimously rejecting the EPA decision on behalf of COG and the Transportation Planning Board ("TPB") extending local metropolitan planning requirements under the Clean Air Act from 1999 until 2005. The EPA had approved the extension without designating the local planning area as a "severe" non-attainment area under the Clean Air Act and that decision, in particular, was rejected by the Court. In its decision and remand, the Court also addressed the failure of the SIP to include an adequate analysis of Reasonably Available Control Measures ("RACM"), to include 3% annual ROP plans and to have contingency measures, all as required by the Clean Air Act.

The D.C. Court decision is particularly troubling, in light of the successful resolution of the NOx SIP call litigation which otherwise allows reliance upon the effects of NOx transport into the Washington area. Most of the EPA/COG rationale for seeking the extension in the first place was associated with assumptions about NOx transport from upwind sources that were the subject of the NOx SIP call. Meanwhile, the ongoing failure to monitor actual attainment of either the one-hour or the eight-hour ozone standard clearly undercuts the assumptions that led to the request of the extension in the first place. Aside from the obvious effects of this decision on Phase II Attainment Planning, it places the metropolitan area in a serious dilemma with regard to conformity planning.

e. Periodic Emissions Inventory Update

The purpose of the periodic emissions inventory update is to provide a point of validation for ROP planning and other SIP activities intended to project attainment of Federal standards. These inventories are supposed to be updated every three years using the latest modeling available from EPA. The newest Mobile6 model was supposed to be available for use in 1999, but for a variety of reasons it has not been available until this year. As a result, all of the emissions inventories up until this year have been run using the Mobile5a model. Since the Mobile6 model has essentially just become available, we do not yet have results to validate our previous projections. 2002 is in the three year cycle, but as a practical matter, it is not anticipated that the inventory will actually be completed until 2003.

f. The Rise of Conformity

The purpose of conformity is to assure that planning for transportation activities is consistent with air quality management goals. In non-attainment areas such as the Metropolitan Washington Area, transportation planning cannot be allowed to proceed if: (1) it contributes to the creation of new air quality violations; (2) it contributes to the worsening of existing air quality violations; or (3) it delays the attainment of ambient air quality standards. Under the system as it is currently structured, the Metropolitan Washington Air Quality Committee ("MWAQC"), in consultation with the TPB, has the responsibility to establish the limits for mobile source emissions that apply to SIP development activities affecting Fairfax County.

In last year's ARE and as late as April of this year, the TPB/MWAQC conformity analysis projected an eight ton per day NOx shortfall based on the mobile emissions budget that was then part of the Phase II Attainment SIP. In the wake of the Sierra Club lawsuit, the TPB, apparently in collaboration with the EPA, has now adopted the old ROP SIP budgets in lieu of the attainment SIP budgets that were thrown out by the Court of Appeals in the Sierra Club lawsuit. The ROP budgets were approved on January 3, 2001 at the same time as the Attainment SIP and they actually exceed the attainment SIP budgets by a considerable amount.[1] As a result of this analysis and even though many questions should be posed about it, COG and the TPB are proceeding under the assumption that the conformity requirements of the CAA are being met and will continue to be met into the future.

Meanwhile, as if to underscore the lack of concern with which the State and the County seem to regard this situation, we see a new transportation referendum on the ballot for the 2002 Virginia general election. If the County truly supports the increased use of tax dollars for expanded transportation infrastructure, it is even more incumbent upon us to take the time and the effort to understand every step of the conformity process. Insofar as we are aware, no one in the County has taken the trouble to carefully analyze this situation and its potential effect on the future of transportation planning. Meanwhile, as of the writing of this report, the proposed conformity determination is under review by the Federal Department of Transportation and EPA.

2. Air Quality Status in Northern Virginia

a. Ground-level Ozone

The Metropolitan Washington, D.C. area, which includes Fairfax County, is currently classified as a serious non-attainment area for ozone. As a result of the Sierra Club decision discussed in the Introduction, it is virtually certain that the Washington Metropolitan area, including Fairfax County, will be reclassified as a

[1] The Attainment SIP budget consisted of 101.8 tons/day of VOC and 161.8 tons/day of NOx in 2005. The counterintuitive result of reversion to the ROP SIP is that the emission budget now consists of 128.5 tons/day of VOC and 196.4 tons/day NOx for 1999 and beyond.

severe non-attainment area for ozone. For all other Federal Air Quality standards, the area should remain in attainment.

b. Ozone Exceedances in 2001

Attainment of the ozone standard in the Metropolitan Washington, D.C. area will require three years with no ozone exceedances. An exceedant day (for the one-hour standard) occurs when an ozone-monitoring site exceeds the NAAQS of 0.12 ppm for at least one hour. In 2001 there were three ozone exceedant days of the one-hour standard in the metropolitan air quality region and one exceedant day in Fairfax County. On that day (June 20, 2001), air quality at the Lewinsville, Virginia monitoring station exceeded the standard. 2001 ozone exceedances of the one-hour standard for the region are shown in Table II-1.

The situation for the eight-hour standard, which will be the new standard in the near future, is not nearly so marginal. In 2001, there were 172 exceedances of the eight-hour standard on 23 different days in the metropolitan area. On 12 of those days, nine or more of the 18 monitoring stations in the Washington Metropolitan area showed exceedances. In Fairfax County alone, there were 41 exceedances of the eight-hour standard.[2] Insofar as they are available, 2001 exceedances of the eight-hour ozone standard are shown in Table II-2.

c. Air Quality Trends in Fairfax County

Although many believe that air quality in Fairfax County is improving, the best that can be said is that the pattern of ongoing violations of the one-hour ozone standard continued at more or less the same level through calendar year 2000. Notably, the pattern of violations has worsened considerably over the past 18 months. In 2002, the level of exceedances of the one-hour standard in Fairfax County has been one of the worst in years, with 11 exceedances so far on five different days. Figure II-1 presents a series of graphs displaying annual trends over the past several years based on the one-hour standard. The 2001 data show a reversal of the downward trend in unhealthful days for the first time in several years, and it looks as though 2002 will show a dramatic worsening in that trend. If we look at the eight-hour standard, the situation is much worse. In 2002, in Fairfax County alone, we have so far seen 71 violations of the eight-hour standard on 25 different days. Figure II-2 presents the eight-hour trends through 2001, and as with the one-hour standard, we can expect a significant worsening once the 2002 data become final.

[2] The 2001 Annual Air Quality Report does not present detailed data on eight-hour violations during 2001 in Fairfax County. The data presented here were taken from the Virginia DEQ website, and although they show the total number of eight-hour exceedances in 2001, they do not disclose over how many days those exceedances occurred.

Table II-1

Regional Ozone Exceedances, 2001

Date	Location	Maximum One-Hour Ozone (ppm)
June 20	Greenbelt, MD	0.136
	Takoma Park, MD	0.132
	Lewinsville, VA*	0.127
	McMillan, DC	0.125
June 26	McMillan, DC	0.127
	Takoma Park, MD	0.126
June 29	Suitland, MD	0.126

*Fairfax County Monitoring Station
Source: Fairfax County Department of Health

Table II-2

Regional Ozone Exceedances, 2001, Eight Hour Average

Date	Number of Stations that Exceeded the Standard	Maximum Value in the Metropolitan Statistical Area; Maximum 8-Hour Ozone (PPM)
May 1	3	0.089
May 2	9	0.094
May 3	10	0.100
May 4	9	0.096
May 5	1	0.089
May 11	1	0.088
June 12	3	0.096

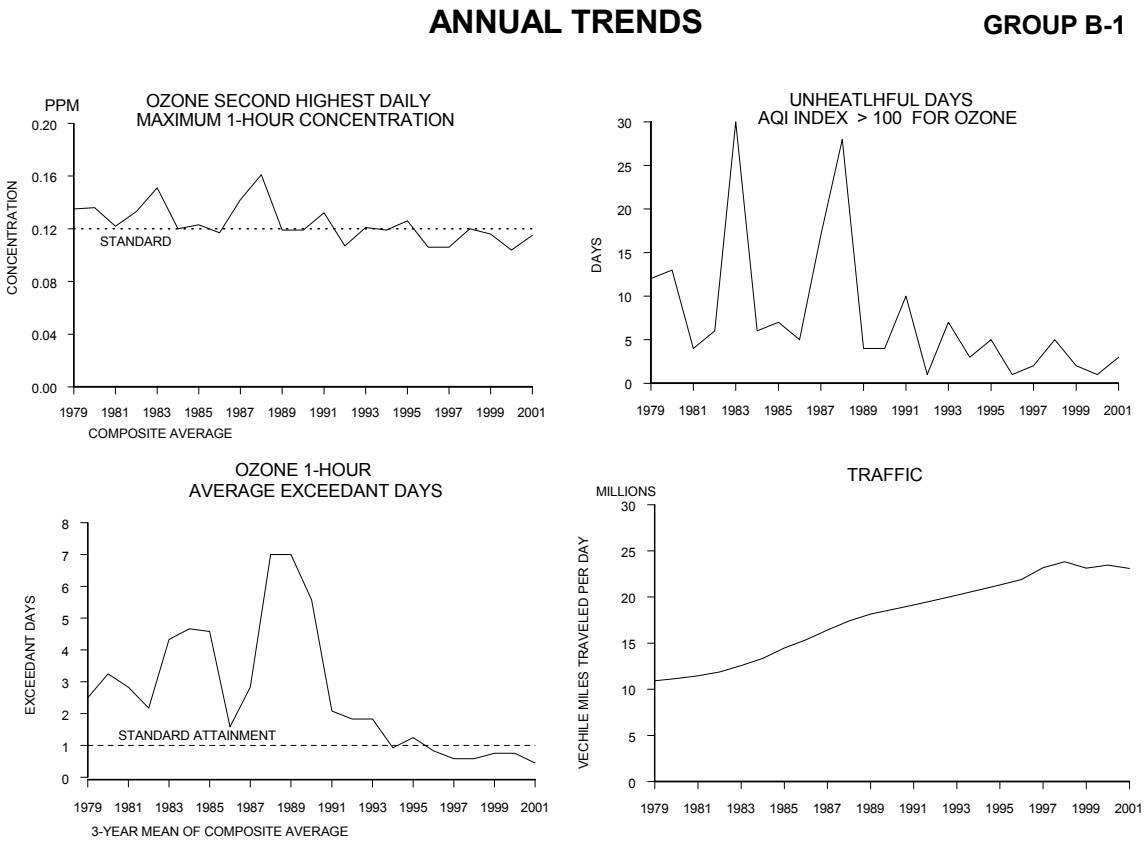
Table II-2

Regional Ozone Exceedances, 2001, Eight Hour Average

Date	Number of Stations that Exceeded the Standard	Maximum Value in the Metropolitan Statistical Area; Maximum 8-Hour Ozone (PPM)
June 13	15	0.104
June 18	8	0.101
June 19	3	0.093
June 20	18	0.112
June 21	10	0.097
June 26	13	0.108
June 27	9	0.101
June 28	12	0.097
July 16	1	0.085
July 17	9	0.094
August 1	1	0.094
August 6	6	0.088
August 7	13	0.092
August 8	7	0.091
August 9	10	0.100
August 15	1	0.085

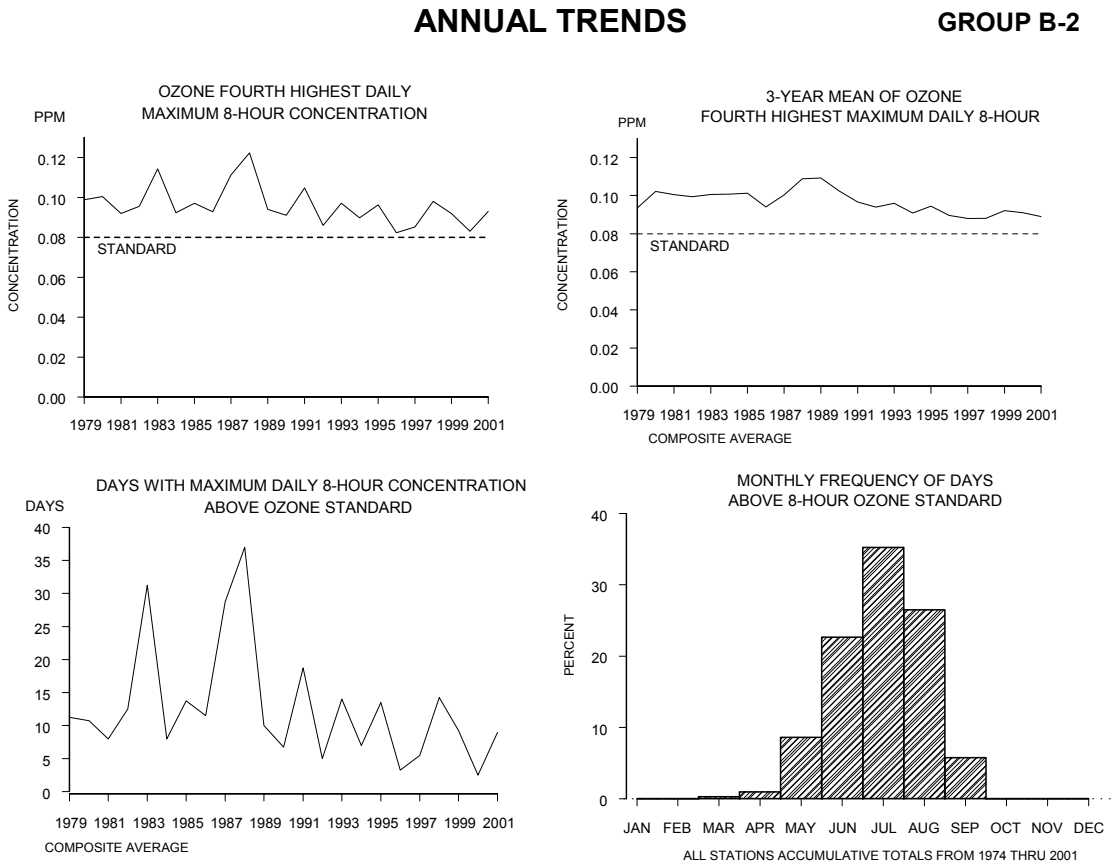
Source: Fairfax County Department of Health

Figure II-1: Air Quality Trends in Relation to a One-Hour Ozone Standard



Source: Fairfax County Department of Health

Figure II-2: Air Quality Trends in Relation to an Eight-Hour Ozone Standard



Source: Fairfax County Department of Health

B. MAJOR PUBLIC AGENCY RESPONSIBILITIES

1. Introduction

Although compliance with National Ambient Air Standards ("NAAQS") and resulting air quality management responsibilities is a function of Federal law, in Fairfax County we have a bifurcated situation where these responsibilities have been split between the State of Virginia and the regional MPO. MPOs are set up under the CAA in metropolitan areas with populations in excess of 50,000. In more difficult situations, MPOs are multi-jurisdictional as is the case in the Washington MPO. Members of MPOs are appointed by the governors and mayors of affected jurisdictions to represent areas included in the MPO. The MPO works with state departments of transportation and transit providers in identifying transportation needs and priorities. They make transportation investment decisions for the metropolitan area and, by default, for the individual regions encompassed within the MPO.

2. Commonwealth of Virginia

a. Virginia State Air Pollution Control Board

This board is authorized to propose policies and procedures for air quality regulatory programs, including emissions standards for landfills and vehicles.

b. Department of Environmental Quality

This department is responsible for establishing standards for air quality monitoring and vehicular inspection and maintenance programs.

3. Region – The National Capital Region Transportation Planning Board (TPB), the Metropolitan Washington Council of Governments (COG), and the Metropolitan Washington Air Quality Committee (MWAQC)

The TPB serves as the designated MPO for the Washington region. The TPB is staffed by the Department of Transportation Planning, which is part of COG. Members of the TPB are appointed, and Fairfax County currently has three members of the Board of Supervisors sitting on the TPB. The TPB's activities are coordinated through COG with the MWAQC, which is the designated entity responsible for air quality planning in the Metropolitan Statistical Area identified under Section 174 of the CAA. Although the MWAQC is technically a different body than the TPB, the members of each body are virtually identical. Other programs, such as those responsible for forecasting demographic changes, are also managed by COG. In this way, COG works toward solutions to regional problems related to air and water quality, transportation, and housing. COG is also responsible for issuing air quality indices on a weekly basis.

a. MWAQC Technical Advisory Committee

This committee reviews technical issues and documents before they are submitted to MWAQC for review and approval.

b. Forecasting Subcommittee

This subcommittee considers how to monitor and report the new eight-hour ozone standard and how to devise guidelines for issuing health alerts during the ozone season.

c. Attainment Subcommittee

This subcommittee considers evidence for the case that the Washington non-attainment area can attain the one-hour ozone standard with the control measures already adopted.

d. Conformity Subcommittee

This subcommittee reviews projects which will contribute to transportation demands, including help in determining if a project will contribute emissions which exceed the region's target volatile organic compounds (VOCs) and nitrogen oxides (NOx).

In the past year, the Transportation Planning Board (TPB), which is the designated Metropolitan Planning Organization (MPO) for the region, has also been actively involved in addressing the conformity issue. The Air Quality Conformity Determination, which was released in October, 2000, is a key document related to conformity analysis that has been produced by the TPB. It is also the TPB that has convened the task force that is attempting to resolve the NOx shortfall that currently plagues the region as well as Fairfax County.

e. Air Quality Public Advisory Committee

This committee has been set up to provide a vehicle to brief citizens on actions pending before MWAQC. This committee functions as an important source of feedback from the public on air quality concerns in the metropolitan area.

4. County of Fairfax

a. Department of Health, Division of Environmental Health, Community Health and Safety Module

This Division is authorized by the Fairfax County Code, Chapter 103, in cooperation with federal and state agencies, to conduct an air monitoring program. This division now provides consultative services to those requesting assistance in indoor air quality issues. If there is a substantial threat to public health, on-site investigations may be provided concerning indoor air quality and exposure to toxic

substances in non-occupational, indoor environments. This Division also represents the County in its interactions with MWAQC. The representative from the Health Department sits as a member of the MWAQC Technical Advisory Committee and functions as a conduit to communicate with the County on air quality issues of concern to MWAQC.

During a time of increasing responsibility to coordinate and manage the increasingly complex body of information relevant to air quality planning in Fairfax County, it is indeed ironic that County staffing for these activities has decreased almost in proportion to the need. During the 1980's, Fairfax County maintained a fully staffed air quality management operation, and into the 90's much of that capability remained until the 1996-1997 time frame. Even in the face of acknowledged concern over degraded air quality, our County air quality capability has been systematically reduced to the point where the only function that can even be minimally fulfilled is monitoring.

b. Department of Transportation

This agency is responsible for the planning and the coordination of improvements that reduce both congestion and the vehicle miles traveled.

C. PROGRAMS, PROJECTS, AND ANALYSES

1. Regional Air Quality Planning

Having failed to attain the federal NAAQS again in 2002, the County continues to sail uncharted waters in its air quality planning adventures. The elements of this complicated situation are pointed out in some detail in the "Issues and Overview" discussion above and elsewhere in the text of this Chapter of the ARE.

Although Phase II planning remains underway, the credibility of that effort is, in our view, substantially at risk given the results of the Sierra Club lawsuit. Meanwhile, the conformity review process seems to be proceeding with a life of its own with little indication that it has much, if any direct relationship with activities that are actually occurring in the County. To a great extent, the County has abdicated its air quality planning authority to the COG structure that coordinates regional planning.

As we have indicated many times in this report, EQAC is concerned about this situation. We do not advocate the re-creation of authority that is properly vested in the COG structure, but we do strongly advocate the need for the County to understand the relationship between its own circumstances and the planning structure currently responsible for air quality planning in the County. We remain concerned, as we have been for the last two years, about the need to act <u>now</u> to tighten the links between planning, particularly for transportation needs, and air quality management.

D. LEGISLATIVE UPDATE

1. Summary of Air Quality Laws Enacted by the Virginia General Assembly – 2001

There was no major or significant legislation in the 2001 General Assembly bearing directly on the subject of air quality that was actually passed into law. The 2001 General Assembly did address the issue of the Northern Virginia Transportation Authority, passing a bill in both the House and the Senate on February 21, 2002 that was signed by the Governor on March 27, 2001.

2. Summary of Air Quality Laws Enacted by the Virginia General Assembly – 2002

As was the case with the 2001 General Assembly, there was no major or significant legislation in the 2002 General Assembly bearing directly on the subject of air quality that was actually passed into law. The 2002 General Assembly did further address the issue of the Northern Virginia Transportation Authority, passing a bill revising statutory provisions in the original law and substituting provisions recommended by the Joint Subcommittee Studying Creation of a Northern Virginia Regional Transportation Authority together with modifications recommended by the Governor. Action on the bill was completed in March and after re-enrollment, the bill was signed by the Governor on April 18, 2002.

E. CONCLUSIONS AND OBSERVATIONS

1. As indicated in the introduction, we are faced again this year with a situation where our recommendations need to be considered in the context of a multi-year dialogue addressing these issues. Last year's staff response observed that there has been no direct action regarding the staffing recommendation that we have now made for the past two years. Nor has there has been any serious or coordinated effort to develop alternative County-based strategies to address air quality issues or evaluate emission reduction strategies that the County can pursue unilaterally. In other words, no change, even though there appears to be substantial agreement with the overall thrust of our recommendations. It does appear from some of the previous responses, however, that there is a certain degree of satisfaction within the County that some of our concerns have been or could be addressed. As a precursor to our recommendations this year, we would like to address this subject more directly than we have been able to in the past.

2. In the 2001 response, reference was made to the 2000 response where staff stated that "…a number of policy and programmatic efforts that support EQAC's recommendation(s) were "highlighted." The implication seems to be that the County is already doing things that should or could address some of the concerns we have raised. The 2000 response specifically referenced three attachments that were provided as examples of efforts the

County has pursued in being proactive in air quality planning. Those three attachments were: (1) a Transportation Planning attachment; (2) a Site Analysis attachment; and (3) a Fairfax County Employer Services Program attachment. This year we would like to clarify our position that the planning and development review processes that were highlighted simply do not address air quality impacts in any focused or meaningful way.

Concerning the Transportation Planning attachment, to merely highlight these objectives without indicating how they have been or might be in the future implemented is relatively meaningless. Obviously, transportation facilities and services should be provided in a manner that minimizes community disruption and adverse environmental impacts. But how that turns into consideration of air quality impacts is not at all clear based on the four policies that were highlighted under the objective that was stated for our consideration.

If staff believes that the County "actively pursues efforts that are consistent with those suggested by EQAC through its planning and development review processes", the examples that they have provided do not support that conclusion. To simply "encourage" development that provides a variety of complimentary uses in close proximity to one another is insufficient. To simply "encourage" development that both facilitates traffic management techniques and emphasizes coordination and interconnections among individual development projects is insufficient as well. This is particularly so given the current state of our efforts to attain air quality compliance in the County.

Finally, the notion that the framework for smart growth that we have recommended exists within the County's Comprehensive Plan is not responsive to the point we are trying to make. Smart growth is much more than just a "possibility" in those areas where it has been successfully pursued. And the notion that it should be more than just a possibility is precisely what we have suggested should be discussed --- in detail! Those responsible for planning and implementing the use of tax dollars for transportation infrastructure and private dollars for development need to understand the concepts associated with "smart growth" and the specifics associated with the use of those concepts. The question is whether smart growth can be successfully and directly integrated into the traditional approach to comprehensive planning and zoning that we find in Fairfax County.

Smart growth is always a "possibility," but Fairfax County is one of the best examples we can think of where it simply has not happened. We seem to be at the stage where we are discussing whether it should or can happen in Fairfax County and it is somewhat fatuous to suggest that it is always a "possibility". The salient point, which is that the County should take a "hard look" at smart growth, has admittedly not occurred.

The more basic conclusion is that the County has not taken adequate steps to integrate air quality planning directly into the planning process by any means, either through the pursuit of additional staffing or through some sort of meaningful consideration of smart growth related programs, or for that matter anything else. Meanwhile, EQAC has itself begun a "more robust and comprehensive discussion" of air quality planning options in the County with the ECC, the PC and the TAC. Our discussions so far can perhaps best be described as cordial and hopeful, although there appears to be a certain degree of defensiveness.

Now that we have begun to proceed down the path of "further discussions", we are particularly concerned that discussing the subject is all that we may be able to achieve.

F. RECOMMENDATIONS

1. The events of the past year have unfortunately vindicated EQAC's past concerns about the state of air quality planning and regulation in the Washington Metropolitan Region. The plain facts are that the COG's effort to manage the Region's air quality control needs through (relatively) marginal measures have not succeeded. The combination of legislation, litigation, public transportation and urban development trends, as well as weather conditions have created a situation in which it is clear that the Region will inevitably be forced to make more difficult choices to improve air quality or face the serious financial and economic consequences of loss of Federal transportation funding and the many other adverse economic and health impacts associated with air quality that does not meet federal standards. Fairfax County can no longer leave the fundamental policy issues to the COG and simply attempt to concentrate on ensuring that our County is treated equitably compared to other jurisdictions in the Region. Fairfax County has too much to lose from a failure to resolve the Region's air quality issues in a manner that has positive results for the County. EQAC urges the County to take a pro-active approach: exercise its leadership capabilities to develop a stronger air quality control program that will ensure compliance with a reasonable margin of safety, and work through the COG to persuade other jurisdictions in the Region to do their fair share as well.

2. To accomplish this objective, EQAC renews its recommendation that Fairfax County strengthen its own capability to understand the technical air quality issues, identify and evaluate the impact of various alternative approaches to ensuring improved air quality, develop policies and programs that can be applied regionally to accomplish that goal, and persuade other jurisdictions to join in these efforts. As indicated in the Memorandum dated August 28, 2002 to Mr. Stalzer (as provided in Appendix A of this report), EQAC strongly recommends the hiring of at least one staff person who can supply the expertise necessary to support the Board of Supervisors in understanding the real choices and consequences and developing the strategy to achieve the County's goals.

3. As important as additional staff, EQAC recommends that the Board of Supervisors devote more of its own energies to understanding and addressing the difficult issues raised by the Region's air quality problems, both in its own decisions and in the guidance it provides to the County's land use and transportation boards and staffs. Without a coordinated implementation of new policies that recognize the necessity for a higher priority for air quality impacts of County decisions, the Board's efforts will be undermined by the continuation of existing approaches that have not succeeded in producing the necessary levels of air quality. An understanding of the relationship of air quality to land use and transportation decisions, both immediate and long term, in all of the relevant units of the County government is essential to a successful effort to overcome the existing difficulties.

4. As a means of focusing attention on the decisions that are necessary, EQAC recommends that the County set a deadline of June 30, 2003 for the adoption of a new Air Quality Attainment Strategy – a public document adopted by the Board that sets out the policies and priorities that Fairfax County intends to pursue both within the County and through COG to ensure the achievement of the necessary levels of air quality with a reasonable margin of safety. The establishment of a target date will create the appropriate sense of urgency in dealing with a problem that will take years to solve but must be met head-on immediately. Hiring new staff, as we have recommended in the past, is just a means to accomplishment of this goal.

LIST OF REFERENCES

2001 Annual Air Quality Report, Fairfax County Health Department, Community Health and Safety Section, Division of Environmental Health.

Agency Responses to the Environmental Quality Advisory Council Recommendations Contained within the 2001 Annual Report on the Environment, (memorandum from the County Executive to the Board of Supervisors dated March 14, 2002).

Information for the 2002 EQAC Annual Report, (memorandum from the Director, Department of Health to the Director, Department of Planning and Zoning dated April 23, 2002).

Bylaws of the National Capital Region Transportation Planning Board, as Amended September 15, 1993.

Overview of the Federal Highway Administration/Federal Transit Administration's Metropolitan Transportation Planning Process, Eastern Resource Center, Federal Highway Administration.

TPB Fact Sheet, National Capital Region Transportation Planning Board.

Virginia DEQ Website, information on ozone exceedances.

CHAPTER III

ECOLOGICAL RESOURCES

III. ECOLOGICAL RESOURCES

This chapter summarizes the status of ecological resources and the actions of public agencies and citizen groups in the management and preservation of these resources.

A. ISSUES AND OVERVIEW

Open space and natural habitat continue to be reduced in Fairfax County, primarily as a result of housing, commercial development, and road building. As this resource is reduced, increased emphasis must be placed on protecting, preserving, and enhancing the remaining open space and natural habitat in Fairfax County.

Fairfax County contains a total of 228,538 acres. Of this total, about 70,000 acres are in open space of some type as of January 2000 (see Table III-1). This represents 31% of the County's land area. However, only about 24,700 acres (11%) are in parks or conservation areas. Another 15,800 acres (7%) are in private open space. Finally, about 29,500 acres (13%) are vacant. However, the figure of 31% of the County being in open space does not give a true picture of open space that is valuable for natural habitat. The park acreage consists of active recreation (ball fields, etc.) as well as passive recreation (stream valley parks, nature centers, etc.) Ball fields, while greatly needed in Fairfax County, do not do much for protecting natural habitat. In a like fashion, much private open space consists of mowed areas and isolated trees (not woodlands). Again, this does little for protecting natural habitat. Both active recreation areas and private open space, however, can help the environment by reducing storm water runoff (by allowing storm water to infiltrate into the soil).

Table III-1
Open Space in Fairfax County

Land Use	Acres
Conservation Areas	1,371
Parks	23,297
Private Open Space – Not Subdivided	556
Private Open Space – Subdivided	15,223
Vacant Land	28,372
Vacant Land with Dilapidated Structures	1,159
Total Open Space	**69,978**

Source: *Acres of Land by Land Use Category, Supervisor District (January 2000),* Fairfax County Department of Systems Management for Human Services.

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While the 13% of the land that is vacant is often wooded, this land is subject to development. Considering the continuing rapid pace of development in Fairfax County, much of this land will soon become residential space, office space, retail space, etc., and not provide much in the way of protecting natural habitat.

Therefore, Fairfax County needs to undertake stronger efforts in order to protect, preserve, and enhance the environmentally sensitive open space in the County. These efforts include the establishment of a Countywide Natural Resource Inventory, followed by a Countywide Natural Resource Management Plan. Additionally, the County needs an aggressive program seeking easements on privately owned environmentally sensitive land and, as opportunities arise, to purchase environmentally sensitive land.

EQAC commends Fairfax ReLeaf, and their volunteers, in their reforestation efforts. EQAC also commends the Fairfax County Park Authority staff in their efforts toward a building a Countywide Baseline Natural Resource Inventory. EQAC supports the Fairfax County Park Authority in their work toward a Countywide Natural Resource Management Plan.

EQAC also commends the Northern Virginia Soil and Water Conservation District for their leadership in a number of activities that will lead to better management of storm water and protection of stream valleys. Additionally, EQAC commends the Northern Virginia Conservation Trust for pursuing and obtaining easements on privately owned environmentally sensitive land. EQAC is pleased that the Fairfax County Board of Supervisors has entered into a public-private partnership with the Northern Virginia Conservation Trust with the purpose of purchasing or obtaining easements on environmentally sensitive land. Since EQAC had not reported in detail on NVCT activities in previous annual reports, this annual report contains an in-depth report on NVCT.

B. PROGRAMS, PROJECTS, AND ANALYSES

1. Fairfax County Park Authority

The Fairfax County Board of Supervisors created the Fairfax County Park Authority (FCPA) in 1950, authorizing the Park Authority Board to make decisions concerning land acquisition, park development, and operations. As a result, Fairfax County has a system of parks that serve a number of uses, including active recreation such as sports, historic sites and buildings, and environmentally sensitive areas such as forests and stream valley lands.

a. Acquisition of Park Land by FCPA

The FCPA acquired 737 acres in FY 2001. As a result, FCPA land holdings now total 21,565 acres. Additionally, in FY 2002, the Board of Supervisors dedicated more than 50 parcels containing floodplains or Resource Protections Areas in stream valleys. This dedicated land also included a 332-acre addition to the Scotts Run Nature Preserve.

b. Green Infrastructure/GIS Mapping

The Fairfax County Park Authority staff continues to develop a Natural Resource Inventory for the County's park system. In the past, a partial attempt at building a Countywide Baseline Natural Resource Inventory was done by the Ecological Resources Inventory Committee (ERIC). Unfortunately, sufficient funding was not furnished to compete this task and the partially complete ERIC database languished. Eventually, with changes in computer hardware and software, this database became unusable. However, the ERIC data has now been successfully converted to the more modern and accessible Microsoft Access Data Base, but has not yet been edited into a form compatible with the County's GIS program. It is not clear to EQAC that this has been done.

However, progress has been made in that the FCPA has developed a modeling tool to identify significant natural and heritage resource areas for the Park Authority's resource protection and management efforts. Using the County's geographic information system (GIS), FCPA has produced a countywide map of "Green Infrastructure" based on a weighted analysis of significant environmental and historic features.

FCPA evaluated hydrology, tree cover, Chesapeake Bay Resource Protection Areas, wetlands, hydric soils, and unusual biological habitat as part of the natural resource analysis. The Park Authority also considered archaeological sites, County historic districts, and historic sites in the heritage resources evaluation. Proximity to existing parkland, other public lands, and open space was also factored into the analysis.

This Countywide Green Infrastructure Map appears to be the Natural Resource Inventory, or at least the basis for it, that EQAC has been recommending. EQAC does not know how complete this map is, so EQAC cannot judge how completely its recommendations on Natural Resource Inventories are satisfied. EQAC will report on this in next year's annual report.

FCPA will also use this modeling tool for projects such as prioritizing acquisition areas based on relative natural and heritage resource importance, and evaluating impacts of land development proposals.

c. Natural Resource Management Plan

In past reports, EQAC recommended that the County Board of Supervisors develop and implement a Countywide Natural Resource Management Plan. EQAC noted that in order to do this, two tasks need to be accomplished first: complete a Countywide Baseline Natural Resource Inventory and adopt a unified Natural Resource Conservation Policy.

EQAC's past recommendation on developing a Countywide Natural Resource Management Plan is being partially fulfilled by FCPA. The FCPA staff has completed a draft of its Natural Resource Management Plan (NRMP). This draft is undergoing internal Park Authority review and is scheduled to be presented to the Park Authority for adoption in the fall. This plan identifies the countywide and Park Authority programs and data sources related to natural resources and analyzes Park Authority policies and the Park Comprehensive Plan provisions affecting natural resources. It addresses natural resources management and planning on parklands within the general issues categories of Vegetation, Wildlife, Stormwater Management and Erosion Control, and Human Impact. EQAC continues to recommend that this FCPA effort be expanded Countywide.

d. Greenways Program

Implementation of the Greenways Program began in 1997 with the Park Authority staff working with citizens groups participating in the Parks Round Table partnership. FCPA continues to pursue the acquisition of property within the greenways and stream valley trails programs. The targeted stream valleys are those of Accotink, Difficult Run, Pimmit Run, and Turkeycock Run. As is the case with Environmental Quality Corridors (EQCs), the ecological boundaries of Greenways may include both public and private open space. Under voluntary cooperative resource management agreements, the Park Authority could offer technical assistance for enhancing the Greenway benefits of private property. This could include the landowner voluntarily granting conservation easements. Conservation easements have been used successfully by groups such as the Nature Conservancy to protect environmentally sensitive lands, and the Nature Conservancy has found that many landowners support the goal of preserving these environmentally sensitive lands.

EQAC notes that the Greenways Program is valuable in that it can expand the protection of environmentally sensitive stream valleys. However, this program should be aggressively expanded through the use of obtaining conservation easements, where possible, on private properties. As noted above, the Nature Conservancy has been successful in this approach. Additionally, the Northern Virginia Conservation Trust (NVCT) is now over six years old and can acquire conservation easements. The Northern Virginia Conservation Trust has now obtained a number of easements in Northern Virginia, showing that this approach in Fairfax County is feasible. The Board of Supervisors should continue its

cooperation with NVCT and aggressively pursue easements aimed at protecting and preserving environmentally sensitive lands.

e. Wildlife Conflict Resolution and Management

Wildlife can cause adverse impacts, both in the County's parks as well as in residential neighborhoods. See elsewhere in this section for a discussion on deer. Beaver activity can also cause adverse impacts. Their activities in stream valley parks can cause excessive losses of mature trees due to flooding. Additionally, beavers will often go into residential neighborhoods for trees. The Park Authority, through its Wildlife Conflict Resolution Policy, is working to mitigate these adverse impacts.

FCPA continues to work to minimize the impact of Canada geese on park properties through humane non-lethal methods. FCPA is actively involved with GeesePeace Fairfax, the County Wildlife Biologist, the Department of Public Works and Environmental Services Facility Management Division, and others to reduce the conflict caused by an overabundance of non-migratory Canada geese in the County. Several golf courses have instituted controlled dog harassment programs, which prevents geese from establishing nests in the parks. The goose egg addling program is well established as a regular activity in many parks and will be expanded as warranted. Addling eggs (coating eggs less than 14 days old with corn oil) will stop the egg from maturing, yet the parent goose will not lay another egg since it is still trying to hatch the addled egg.

The FCPA is working at developing a database for tracking wildlife related complaints, reports, and questions. The database was recently modified so that the information it contains may be displayed on the County GIS system. This allows the display of beaver and other wildlife incident reports in map form. This ability to display both temporal and geographic information simultaneously will allow the determination of population trends and habitat preferences in the County.

f. Invasive Plant Control Efforts

Invasive plants are a problem because they can out compete and replace native species. This change in vegetation disrupts the life cycles of many flora and fauna that depend on native vegetation. Huntley Meadows Park received a grant (a $39,200 matching grant) to be used for suppression and further research on *Microstigeum viminium*, also known as Japanese stilt grass, and *Berberis thunbergii*. This was the third year in an ongoing active management program at Huntley Meadows that is providing valuable information for use at other sites around the County. The agency is also striving to use native plant species, whenever possible, to stabilize disturbed areas around new trails and other construction sites.

This 2001 project at Huntley Meadows was successful in eradicating *Microstigeum viminium* throughout the 262-acre project area. Additional funds are being sought to continue these control efforts.

2. Northern Virginia Regional Park Authority

The Northern Virginia Regional Park Authority (NVRPA) is developing general management plans and natural resource management plans for their parklands in order to protect the important natural and cultural resources located in these parks. These plans include detailed inventories of these resources and suggest parameters for operation and development of the parks.

In 2001, NVRPA completed both a draft General Management Plan (GMP) and a Natural Resource Management Plan (NRMP) for the 1,003-acre Pohick Bay Regional Park. They are working on documents for Bull Run and Hemlock Overlook Regional Parks, and plan on developing plans for each park in the NVRPA system.

The GMP for the Pohick Bay Regional Park contains several appendices worthy of specific note. First is a Natural Resources Inventory and Existing Conditions Assessment Report. This Natural Resources Inventory is a good example of what EQAC has been recommending that should be done for all of Fairfax County. This inventory characterized soils, slopes, areas susceptible to erosion, wetlands, plant communities and species, wildlife habitat and species, invasive exotic plant species, and endangered and threatened species. The second appendix contains a Cultural Resources Inventory. Included in the inventory is a very interesting history of the lands that now constitute the park. The third appendix contains maps showing and locating the resources identified in the first two appendices.

The NRMP provides the strategic plan for managing the natural resources within the park. This plan takes into account the entire ecosystem and balances recreational use and conservation of resources so each is sustainable. The natural resources identified in the GMP are prioritized to allow better planning and management of these resources. Also, the prioritization shows where improvement, or monitoring of, existing conditions will protect those natural resources of significant value. However the NRMP also notes that the prioritization of natural areas does not mean some areas have little or no value. All natural systems serve a function in ecology and should be protected as possible.

3. Fairfax ReLeaf

Fairfax ReLeaf is a non-profit, non-governmental organization of private volunteers who plant and preserve trees, restore habitat, and improve community appearance in Northern Virginia. They have testified to County officials and politicians that an unacceptably rapid rate of tree loss in Fairfax County continues. They state that the

County has not taken effective steps to stem this loss of forest infrastructure. They therefore advocate:

(1) Conservation design of subdivisions and conservation clustering;
(2) Smaller multipurpose utility swaths;
(3) Maximum reforestation and tree preservation on Department of Public Works (DPW) easements;
(4) Reconsideration of DPW tree destruction in and around stormwater structures;
(5) Re-convening of County's Tree Preservation Task Force;
(6) Tree preservation workshops for private-sector site engineers and planners;
(7) Tree preservation and restoration as component of County's stormwater strategy;
(8) Authentic consideration for tree preservation in County's planning and zoning special exception decisions;
(9) Restoration of County's urban forestry branch to its former strength in site planning process; and
(10) Redeployment of Park Authority's tree removal resources into tree preservation and planting.

4. Northern Virginia Conservation Trust

Past EQAC reports have recommended that the Fairfax County Board of Supervisors form public-private partnerships for the purpose of obtaining easements on environmentally sensitive land. EQAC pointed out that entities such as The Nature Conservancy uses easements very successfully as a way of protecting environmentally sensitive properties. With the signing of a Memorandum of Understanding on June 20, 2001 between the Fairfax County Board of Supervisors and the Northern Virginia Conservation Trust (NVCT), such a public-private partnership now exists.
The NVCT is an ideal partner for Fairfax County in the public-private partnership. Founded in 1994 as the Fairfax Land Preservation Trust, they changed their name in 1999 to The Northern Virginia Conservation Trust to better reflect the regional scope of their organization. They are a 501(c)(3) nonprofit land trust dedicated to preserving and enhancing the natural and historic resources of Northern Virginia. They also have formed public-private partnership Arlington County and own properties or easements in Arlington, Fairfax, Loudoun, Prince William, and Stafford Counties.

Under the Memorandum of Understanding, the Fairfax County Board of Supervisors provided an annual contribution of $235,000 to NVCT and will include at least $235,000, plus an inflation factor, in the next two years. (The Memorandum of Understanding is for three years, starting July 1, 2001.) The first year's funding will be used as follows:

- $50,000 to the Land Fund to be used for costs directly related to the acquisition of easements, fee simple purchases, and/or options to purchase land in Fairfax County;
- $65,000 to fund a land specialist within NVCT to work with targeted landowners in Fairfax County on easements and other conservation options;
- $50,000 for Administrative/Management staff and materials directed at managing the NVCT conservation efforts in Fairfax County;
- $50,000 for public outreach staff and materials directed at increasing the public's awareness of conservation options; and
- $20,000 for the NVCT Land Stewardship Fund as an endowment to cover long-term monitoring and enforcement of perpetual easements.

Under the Memorandum of Understanding, NVCT will provide the following programs and services to Fairfax County residents:

1. Site Inventory: NVCT staff will use a variety of Fairfax County sources to identify sites:
   - Identify land in Fairfax County that is either vacant or underused, using GIS mapping information, to be targeted for easement donation or purchase;
   - Identify privately owned land that is of special habitat value or to protect the County's Environmental Quality Corridors, resulting in a host of environmental benefits such as tree and habitat preservation; and
   - Identify those historic sites listed on the County's Inventory of Historic Sites that could be appropriate for protection through an easement.

2. Coordination with the Fairfax County and Northern Virginia Regional Park Authorities: NVCT, working with County staff, will use GIS information and County databases to aid in site identification and public benefit determination. This information would be shared with the Fairfax County Park Authority (FCPA) and the Northern Virginia Regional Park Authority (NVRPA). Coordinating with these entities, NVCT will identify which of the targeted sites are beyond the current resources or the charter of the County or Regional Park Authorities to acquire in fee simple or by easement. Properties not targeted by either of the two Park Authorities will be tasked to the NVCT. As a result of this approach, any strategy to target properties that are adjacent to FCPA or NVRPA parkland would be closely coordinated with the appropriate park authority. In those instances where NVCT pursues easements on properties that adjoin parkland or serve park purposes, the appropriate park authority should be given first consideration for holding these easements as long as the property owner has no objections.

3. Public Benefit Determination: All conservation easements must have a public benefit to be eligible for federal and state tax benefits. To determine public benefit, any potential easement property must have at least two of the following attributes associated with its conservation. The first bullet below references

"protection of lands in furtherance of governmental plans or policies" which are embodied in the Policy Plan of the County's Comprehensive Plan.

- Contributes to protection of lands in furtherance of governmental plans or policies;
- Contains endangered, threatened, or rare species;
- Contains relatively natural wildlife habitat, ecosystems, or natural features;
- Contains wetlands, floodplains, waterways, riparian corridors, aquifers recharge areas, watershed or other land necessary for protection of water supply, water resources or wetland habitat;
- Buffers natural areas, wetlands, wildlife habitats, or other sensitive areas;
- Provides connections to or between other protected or open space lands facilitating greenways;
- Has historic or archaeological value or is adjacent to and buffers such lands;
- Contains unique or outstanding physiographic characteristics;
- Offers geographical diversity to the easement program;
- Offers significant relief from urban closeness and/or helps define community form.

4. Securing the Easement: Once potential properties have been identified, owners of targeted properties will be contacted to determine if they have any interest in exploring conservation options. If they are receptive, the Trust's staff will work with the property owners until the transaction is complete or negotiations end.

Since NVCT became eligible to receive easements in 1999, they have recorded 11 conservation easements and taken ownership of three properties in Fairfax County. These properties protected by NVCT add to the protected ecological resources of the County. (See Table III-2 for a listing of these properties.) The three properties owned by NVCT all have a significant stream connection. One is on Pimmit Run, another is on Little Hunting Creek, and the third is a forested buffer to Backlick Run. In May 2002, NVCT transferred the Backlick Run property to the FCPA to expand the stream valley park. Of the 11 conservation easements, four are contiguous to existing parkland, seven have streams or ponds on the property, and most of the properties under easement have significant areas of forest.

Table III-2 Fairfax County Open Space Preserved Through NVCT Efforts			
Date	**Name**	**Acres**	**Type**
December 1999	Haldane Easement	4.5	One easement
April 2000	Ruckstuhl Easement	7	Four easements
August 2000	Davenport/Pimmet Run	1	Fee simple ownership
December 2000	Narins Easement	5	One easement
December 2000	Bliss Easement	5.6	One easement
1 May 2001	Rare Oak Hickory Forest	385	Grant funds for acquisition
1 July 2001	Rentsch Easement	5	One easement
1 July 2001	Cobb Easement	12	One easement
1 August 2001	Thornton Easement	5	One easement
1 August 2001	Lindsay Easement	5	One easement
2 January 2002	Backlick Run	0.6	Fee simple ownership
2 March 2002	Little Hunting Creek	2	Fee simple ownership
Total Fairfax County Land Preserved		**437.7**	

Source: *Policy Plan Amendments to the Comprehensive Plan – Conservation Easement Program*, Letter From Paul Gilbert, NVCT President, to Environmental Committee of the Fairfax County Board of Supervisors, April 8, 2002.

During 2001, NVCT worked to enhance the environment and engage the public through conservation activities including tree plantings, invasive species removal, easement monitoring training, and a birding event. The tree plantings and invasive species removals are designed to enhance the wildlife habitat value of preserved lands.

When EQAC recommended the creation of a private-public partnership to record easements on environmentally sensitive land, EQAC also recommended an aggressive program to identify and record these easements. NVCT is starting such a program. In April 2002, NVCT sent out over 100 letters to landowners of vacant land with significant RPA along Little Hunting Creek. Earlier, NVCT did several mailings to all the private landowners along Accotink Creek. Hopefully, this will result in more easements and increased protection of sensitive property in these stream valleys.

EQAC encourages all landowners whose property contains environmentally sensitive land such as wetlands, stream valleys, and forests to consider contacting NVCT and learning more about easements. If these landowners grant an easement, they will not

only protect sensitive land, but can realize some financial benefits. A perpetual easement donation that provides public benefit by permanently protecting important natural, scenic and historic resources may qualify as a Federal tax-deductible charitable donation. Under the Virginia Land Conservation Act of 1999, qualifying perpetual easements donated after January 1, 2000, may enable the owner to use a portion of the value of that gift as a state income tax credit. Fairfax County real estate taxes could also be reduced if the easement lowers the market value of the property.

Additional information on NVCT can be found on their web site, http://www.nvct.org.

5. Northern Virginia Soil and Water Conservation District

The Northern Virginia Soil and Water Conservation District (NVSWCD) continues to provide leadership in the area of bioengineering techniques in streambank stabilization and in the general area of erosion and stormwater control. The Kingstowne project was a restoration project using bioengineering techniques to restore and stabilize a severely degraded stream segment in the Dogue Creek watershed (in the Kingstowne area). The effort was lead by NVSWCD with the aid of Fairfax County agencies and two citizen groups (Friends of Huntley Meadows Park and Citizens Alliance to Save Huntley). The project was initiated in 1998. This project is now a showcase for successful restoration applying the principals of fluvial geomorphology and soil bioengineering. The result is a less erodable configuration using natural vegetation to stabilize the streambanks.

Maintenance needs for this project have been diminishing after grade control structures (rock cross vanes) were installed in the fall of 2000 by NVSWCD and the Department of Public Works and Environmental Services (DPWES). There were eight grade controls installed at the stream's slope, thereby reducing the high velocity in the stream and cutting down on erosion at the downstream end of the project. Specially selected stones were placed at eight locations inside the stream and tied in carefully to the bed and sides of the stream.

The new re-engineered 1,200 foot long channel has successfully carried several bank full storm runoff events. During 2001, the Kingstowne restoration project required practically no maintenance. The streambank and riparian vegetation has become well established.

As a result of this project, NVSWCD developed a brochure that describes the impact of increases in impervious surfaces on stormwater runoff, the concepts of fluvial geomorphology and soil bioengineering which were used to analyze and design the project, and the construction and implementation of the project. DPWES reprinted 500

copies of this brochure for the Greenways-Blueways Conference that was held in Arlington in September 2001.

A number of streambank protection and restoration projects are discussed later in this chapter. NVSWCD played, and continues to play, a pivotal role in the analysis and design of these projects.

6. Fairfax County Wetlands Board

Staff reviewed approximately 40 Joint Permit Applications to determine if permits were required from the Wetlands Board during calendar year 2001. The Fairfax County Wetlands Board evaluated and approved three permit applications during the 2001-2002 fiscal year – one shoreline stabilization project, one community pier, and one tidal wetland expansion/enhancement.

The Office of Public Affairs worked with staff to develop a Wetlands Permitting information piece to explain the County's Wetland Permitting process. This information piece will be on the County's web site.

7. Metropolitan Washington Council of Governments

The Metropolitan Washington Council of Governments (MWCOG) is planning a project in Fairfax County, Arlington County, and Alexandria in the Holmes and Tripps Run Watershed. This project is being done under a grant from the U. S. Geological Survey (USGS) and in partnership with Virginia Tech and USGS. The name of the project is the Urban Biodiversity Information Node: Holmes and Tripps Run Watershed Pilot.

The National Biological Information Infrastructure (NBII) http://www.nbii.gov is a broad, collaborative program to provide increased access to data and information on the nation's biological resources. The NBII links diverse, high-quality biological databases, information products, and analytical tools maintained by NBII partners and other contributors in government agencies, academic institutions, non-government organizations, and private industry.

MWCOG is a regional organization of Washington area local governments. MWCOG is composed of 17 local governments surrounding our nation's capital, plus area members of the Maryland and Virginia legislatures, the U.S. Senate, and the U.S. House of Representatives. Founded in 1957, MWCOG is an independent, nonprofit association supported by financial contributions from its participating local governments, federal and state grants and contracts, and donations from foundations and the private sector.

The Urban Biodiversity Information Node (UrBIN) will focus on the emerging information needs for managing watersheds in urban and urbanizing environments in Northern Virginia. This project, focusing initially on the Holmes and Tripps Run watershed, is part of a larger, long-term project with the USGS's NBII to examine the effects of urban and suburban growth upon biodiversity in the metropolitan Washington area. The objective of the overall project is to supply a variety of users of the NBII Urban Biodiversity Node with the information that is needed to make sound, environmentally responsible decisions. Data, tools, and best management practices will be made available and will enable communities to address issues such as sprawl, habitat fragmentation and loss, and water and air quality problems.

Researchers will investigate the Holmes and Tripps Run watersheds to:

- Synthesize urban watershed data into a geographic information system;
- Develop appropriate urban watershed assessment procedures;
- Determine the relationship of urban land use and biodiversity;
- Integrate urban biodiversity information into land use decisions; and
- Present research findings, assessment procedures, and watershed information in accessible formats to meet identified stakeholder needs and decision processes.

An additional benefit of this project will be additional information to incorporate into FCPA's Countywide Green Infrastructure Map.

8. Urban Forestry

a. Urban Forestry Division

In FY 2001, the Urban Forestry Division (UFD) continued to serve a unique and diverse set of customers. The Urban Forestry Division customer base includes citizens, builders, developers, planners, engineers, landscape architects, private arborists, and other County staff and agencies, including the Board of Supervisors (BOS), Planning Commission, Tree Commission, Environmental and Facilities Review Division (EFRD), Environmental and Facilities Inspections Division (EFID), Department of Planning and Zoning (DPZ), Office of Capital Facilities (OCF), and the School Board.

The following table (Table III-3) summarizes the workload of UFD based on the requests for assistance that were completed for 1999, 2000, and 2001. These figures demonstrate a slight decline in the requests for assistance in FY 2001.

A significant amount of staff time in 2001, however, was also dedicated to preparation of amendments to the Zoning Ordinance, Subdivision Ordinance, and Public Facilities Manual (PFM) relating to County tree cover requirements, and tree

and vegetation preservation and planting. The preparation of the amendments included ongoing workshops and meetings with County staff, citizens, and the development community. The Urban Forestry Division staff also provided presentations on the amendments to the Tree Preservation Task Force and Engineering Standards Review Committee, and obtained formal endorsement of the amendments from both groups. On December 3, 2001, the BOS authorized advertisement of the amendments for the public hearing. The amendments were approved by the Planning Commission on January 30, 2002, and received final approval by the BOS on February 11, 2002.

Table III-3
Urban Forestry Division Workload, 1999-2001

Type of Assignment	**Number of Completed Requests**		
	1999	***2000***	***2001***
Waivers	50	46	64
Zoning Cases	259	285	208
OSDS Requests (Plan Review and Site Inspections)	1,361	1,631	1,511
Other (BOS, FCPS, Other County Agencies, etc.)	485	563	559
Hazardous Trees	78	61	25
Total Complete	**2,233**	**2,586**	**2,367**

Source: Fairfax County Department of Public Works and Environmental Services

In response to a request by the BOS, staff examined strategies to encourage the use of desirable tree species during the development process in the County. The response to the BOS included several recommendations. The recommendation to provide additional tree canopy credit for the use of desirable tree species was incorporated into the amendments to Section 12 of the PFM, "Vegetation Preservation and Planting." The recommendation to propose new, or amend existing state enabling legislation was reflected in proposed language changes to Virginia State Code § 15.2-961 (see enabling legislation discussion below).

The Urban Forestry Division staff provided training to Virginia Tech forestry, urban forestry, and landscape students, as invited class instructors. Training was also provided to other County employees, including classes on tree preservation and tree planting to the DPZ. Staff continued to provide training to new inspectors in EFID on County Code requirements for vegetation preservation and planting. Additionally, staff presented a paper on "Tree Preservation in Development" at the Mid-Atlantic Chapter of the International Society of Arboriculture annual meeting.

b. Gypsy Moth Program

The Gypsy Moth Program came under the supervision of the Urban Forestry Branch Chief in December 1996. This program contains eight positions. In June 1997, the Gypsy Moth Program office moved from the Government Center building to the Herrity Building.

The gypsy moth was first detected in Fairfax County in 1981. The Board of Supervisors enacted an Integrated Pest Management (IPM) Program to control the gypsy moth, *i.e.*, reduce gypsy moth populations below defoliating levels. The goal of the program is to minimize the environmental and economic impacts of the pest by limiting the amount of tree mortality and use of pesticides in the environment. Each year, the following control methods are considered:

- **Mechanical:** The gypsy moth egg mass Search, Scrape, and Destroy Campaign and Burlap Banding for Gypsy Moth Caterpillars. These are citizen involvement programs.

- **Biological:** Release and monitoring of gypsy moth parasites and pathogens, and aerial and ground applications of *Bacillus Thuringiensis* (*Bt*).

- **Chemical:** Aerial and ground applications of Diflubenzuron on high infestations.

- **Educational:** Self-help program and lectures to civic associations and other groups.

In 2001, gypsy moth caterpillar populations increased significantly compared to the previous five years. At this time, it can not be determined whether this increase is a sign that populations will reach outbreak proportions in the near future, or if the populations will stay at moderate levels.

Egg mass surveys conducted by County staff in the fall of 2001 indicated that 5,500 acres in 29 areas of the County had gypsy moth infestations that warranted aerial treatment in the spring of 2002. Most of the treatment areas were located north of Route 66; however, populations were found in some southern areas of the County.

In addition to the aerial treatment areas, there were 90 acres in isolated areas that warranted ground treatment. The pesticide used for these treatments was *Bacillus Thuringiensis* (*Bt*), a material registered with the Environmental Protection Agency for use against the gypsy moth caterpillar in forested, residential communities.

Gypsy moth populations have increased in Virginia and the northeast. There was no detected defoliation by the gypsy moth in Fairfax County in 2001; however, the Virginia Department of Agriculture and Consumer Affairs reported 440,409 acres of defoliation elsewhere in Virginia.

Experts agree that the reason for the current population increase is due to the lack of the fungus *Entomaphage maimaiga*. The fungus was introduced from Japan and can now be found throughout the eastern United States where gypsy moth infestations exist. After a period heavy rain, caterpillars come in contact with the spores of this fungus, are quickly infected, and eventually die. Record low rainfalls for the spring of 2001 and 2002 will probably have an effect of increasing gypsy moth populations since levels of the fungal pathogen will be low. Information concerning the biology of this fungus can be found in previous *Annual Reports on the Environment* or by contacting the Gypsy Moth Program Office.

In addition to the measures being taken by the County, citizens can help in the fight against the gypsy moth. Citizens are encouraged to destroy egg masses and caterpillars found on their properties. Banding trees with burlap strips can trap the caterpillars. Scraping the masses into a container of soapy water can destroy egg masses.

c. Fall Cankerworm

The fall cankerworm, *Alsophila pometaria*, is a defoliating insect found throughout much of North America. This insect is native to the United States and feeds on a broader range of trees than the gypsy moth. The caterpillar stage of this insect, often referred to a inchworms or loopers, feeds in the spring and will feed on a wide variety of trees, but tends to prefer maples, hickories, ash, and oak -- all of which are found in abundance throughout Fairfax County. The fall cankerworm caterpillars, the only life stage of this insect that causes damage to trees, emerge in early spring about the time of bud break and begin feeding almost immediately. Feeding continues throughout much of the spring until the mature caterpillars drop off the tree, enter the soil, and pupate.

Low level cankerworm infestations can cause nuisance problems due to the number of caterpillars and their droppings. With more severe infestations, defoliation can occur resulting in stress to the trees and possible tree mortality. As in severe gypsy moth infestations, cankerworm infestations tend to be a severe nuisance to homeowners, making yards and patios unusable for several weeks in the spring. Outbreak phases usually last two or three years in succession and then decrease due

to disease, perdition, and parasitism. In some instances; however, populations do not decline and some type of control may be warranted. According to experts from the United States Forest Service, this insect thrives in older, mature forest stands that are under stress from external sources. Many older, suburban neighborhoods throughout the County, like those found in Mount Vernon and Lee Districts that are already infested, have this type of forest cover and are suitable locations for sustained outbreaks of the fall cankerworm.

The Forest Pest Program conducted a large aerial treatment program during the spring of 2000. County staff have monitored for adult female moths throughout the Mount Vernon and Lee Districts in January of 2001 and 2002. Results of these monitoring efforts indicated that the 2000 treatment program was very effective. During the spring of 2002, ground spraying of approximately 75 acres was conducted by contracted staff.

The Forest Pest Program will monitor for fall cankerworm again this winter. They expect that the populations of this pest will be low in the near future.

d. Tree Preservation Task Force

The Tree Preservation Task Force activities for the calendar year 2001 primarily focused on completion of the proposed amendments to the County Code relating to tree cover, and tree preservation and planting requirements. In May 2001, the Tree Preservation Task Force endorsed the amendments package.

In 2002, the Tree Preservation Task Force will continue to monitor the implementation recommendations that are still in progress. It will also continue to review County policy and procedures that effect tree preservation during the development of public and private property. The Preservation Task Force will convene in the spring of 2002 to review the progress of the S.B. 484, which was submitted by Fairfax County as part of its 2002 Legislative Program (see Summary of Tree Commission activities). The Tree Preservation Task Force may elect to arrange and participate in a meeting with the legislative patrons, and the Virginia Building Association in order to encourage a dialogue focused on the core issues of the proposed legislation.

e. Tree Commission Activities and Issues in 2001

In 2001, the Tree Commission proposed amendments to the Virginia State Code § 15.2-961 that relate to tree canopy requirements on development sites. The proposed amendments would change the core concept of this section from tree replacement to tree conservation, with a strong emphasis on tree preservation. The proposed changes would also enable the County to regulate the use of native and other desirable trees to meet tree cover requirements. These proposed changes became the basis for the County's proposed amendments to Code § 15.2

f. Summary of Proposed/Anticipated Changes to Tree Preservation Enabling Legislation

In reaction to the limited tree preservation authority provided by the Code, and recommendations by the Tree Preservation Task Force, Fairfax County initiated a proposal to amend the Virginia State Code § 15.2-96 1, as part of its 2002 strong emphasis on tree preservation. Both bills were introduced in the 2002 Virginia State Legislative Assembly, but were tabled until the 2003 session due to opposition by the Virginia Building Association.

g. Status of Grant Proposal for Satellite Mapping of the County's Tree Cover and Analysis of Tree Cover Data

With the technical support of the Geographic Information Services Branch, of the Department of Information Technology, UFD has completed a countywide tree cover analysis, using year 2000 10-meter per pixel SPOT satellite imagery. The analysis demonstrates that in year 2000 approximately 50% of Fairfax County's 235,000 acres was covered with tree canopy. A comparison of the year 2000 analysis with tree cover levels derived from 1995 SPOT imagery reveals that the countywide tree cover has not changed significantly in the past five years. Comparison of the images demonstrates that relatively large tracts of native forest were removed during land development. However, the canopy of trees that were planted in new developments and established neighborhoods expanded, offsetting the lost of native tree canopy. In addition to the years 1995 and 2000, UFD will analyze satellite imagery from 1990 to detect the total rate of canopy change from 1990 to 2000.

It should be noted that tree cover change-detection studies through satellite imagery (remote sensing) only provide a two-dimension model of the extents of countywide tree cover. These studies do not provide data relative to the three-dimensional structure, biomass, leaf surface area, health or bio-diversity of the countywide tree cover. While comparison of the two-dimensional tree cover analyses shows little change to the total countywide tree cover level from 1995 to 2000, ground-level survey data will need to be collected and analyzed before a full impact assessment can be made regarding the effects of the rapid urbanization of the last decade on Fairfax County's urban forests. The change detection data from 1990, 1995 and 2000 will be further broken down into 30 major watersheds in Fairfax County, and 37 other watersheds in Prince William County, Arlington County, and the City of Alexandria.

UFD is currently working to develop a countywide map for use as a layer on the County's geographic information system that will delineate the distribution of naturally occurring and landscaped vegetation, as it exists in 2002, using the

National Vegetation Classification System (NVCS). This classification system was originally developed by the Nature Conservancy and has been adapted by the United States Federal Standard Geographic Data Committee as the Federal Government Standard FGDC-STD-005, 1997.

This classification system will be used to map the entire county into areas that are currently populated with native tree, shrub, and herbaceous plant species, as these species group into larger associations, or plant communities. These communities usually coincide with distinct environmental gradients and are dependent on the presence of specific abiotic factors, such as elevation, climate, geologic substrate, and soil and hydraulic regimes.

The following is an example of how NVCS would be used to classify a forest alliance that could be found in the Mount Vernon or Lee District area:

Sweet gum, red maple, willow oak and swamp doghobble, forms a plant community that is associated with the seasonally flooded forest of shallow basins and depressions of the Coastal Plain of the Chesapeake Bay region. The substrate is characterized by mineral soils, generally acidic, gleyed or mottled, sandy or clay loams. Characteristic tree species include *Acer rubrum*, *Liquidambar styraciflua*, and to lesser degree *Nyssa sylvatica*. Associate plants include *Ilex opaca*, *Magnolia virginiana*, *Sassafras albidum*, *Quercus palustris*, and *Quercus phellos*. The shrub layer is populated by *Leucothoe racemosa*, *Vaccinium corymbosum*, *Clethra alnifolia*, and *Rhododendron viscosum*. *Smilax rotundifolia* is a characteristic vine. The herbaceous layer is normally sparse but may include *Mitchella repens*, *Osmunda cinnamomea*, *Woodwardia areolata*, and *Polygonum* spp.

Table III-4 shows how various hierarchical levels of the NVCS apply to this plant community, which is commonly known as the Sweet gum swamp forest:

Table III-4
NVCS Hierarchical Levels, Sweet Gum Swamp Forest

Ecological System	Terrestrial
Formation Class	I - Forest
Formation Subclass	I.B. – Deciduous forest
Formation Name	I.B.2.N.e – Seasonally flooded cold-deciduous forest
Plant Association or Alliance Name	I.B.2.N.e.6 - LIQUIDAMBAR STYRACIFLUA - (ACER RUBRUM) SEASONALLY FLOODED

	FOREST ALLIANCE

Source: Fairfax County Department of Public Works and Environmental Services

UFD will use the gradient-oriented transect (Gradsect) sampling methodology to determine the location and total number of ground survey plots that will be used as base information for the countywide NVCS map. The data from these surveys will be used in an attempt to correlate the presence of known plant communities to their specific reflective signatures found in high-resolution multi-spectral satellite imagery. If this process is successful, then the correlation of the vegetation signatures to geo-reference data in the satellite images will help automate the mapping process.

Once the entire landmass of Fairfax County is mapped using this system, a vegetation map will be produced for each of the 30 major watersheds. This data should provide a valuable benchmark that can be used to formulate and evaluate the effectiveness of countywide vegetation and ecosystem management policies. The vegetation-mapping project is expected to be complete by August of 2003.

h. Summary of the Recent Amendment to the Chesapeake Bay Preservation Ordinance

On February 25, 2002, the Fairfax County Board of Supervisors adopted an amendment to the Chesapeake Bay Preservation Ordinance (Chapter 118 of the *Fairfax County Code*) to address issues related to violations and penalties, restoration of Chesapeake Bay Preservation Areas, and removal of indigenous vegetation from Resource Protection Areas (RPAs). The amendment:

- Clarified what is permitted under provisions of the Ordinance that permit the removal of indigenous vegetation from RPA buffers for the creation of sight lines, access paths, general woodlot management, habitat management, and shoreline erosion practices;

- Required that a plan be submitted to DPWES for review and approval prior to the removal of indigenous vegetation from the RPA buffer to create a sight line or vista;

- Incorporated planting requirements for the establishment of RPA buffers;

- Limited the widths of boardwalks, pathways, and paved paths serving individual residential properties to four feet (except as necessary for handicapped access) in RPAs; and

- Added a new section addressing violations and penalties that, among other things, increased criminal penalties for violations of the Ordinance from Class 2

misdemeanors to Class 1 misdemeanors and provided for a civil penalty of up to $5,000 for each day of violation (or a one-time payment of civil charges not to exceed $10,000 for each violation).

i. Status of Actions to be Taken to Comply with the Revised Chesapeake Bay Preservation Area Designation and Management Regulations

The Chesapeake Bay Local Assistance Board amended its Chesapeake Bay Preservation Area Designation and Management Regulations (9 VAC 10-20 et seq.) on December 10, 2001. Jurisdictions have been given until March, 2003 to incorporate the new requirements of the Regulations into local ordinances. Amendments to the County's Chesapeake Bay Preservation Ordinance, Erosion and Sedimentation Control Ordinance, Subdivision Ordinance, Zoning Ordinance, and Public Facilities Manual will be necessary. Once the County has amended its ordinances, the Chesapeake Bay Local Assistance Department (CBLAD) will review the ordinances for consistency with the amended state Regulations.

The major changes to the Regulations include:

- RPAs must be designated around all perennial streams. It is anticipated that this will result in a significant increase in the extent of RPAs. The Regulations require that a site-specific determination of perennial stream flow, based on in-field indicators, be provided at the time of plan submission and a delineation of the RPA be performed as necessary. DPWES is currently performing field studies to identify perennial streams throughout the County. These field studies will ultimately satisfy the requirement to determine the location of perennial streams. This effort will be completed in 2003. Field studies for approximately 60% of the County will be completed this year. Following completion of the field studies, an updated set of RPA guidance maps will be available in late 2003. An interim procedure may need to be implemented to address identification of perennial streams for development projects for the period between the effective date of the amendments in March 2003, and the completion of the mapping project.

- The provisions allowing encroachment into RPAs for non-permitted uses have been revised substantially to require, for certain types of exception requests, that: (1) a public hearing be held; (2) adjoining property owners be notified; and (3) a committee designated by the Board must review and approve these exceptions. The composition of the hearing board is not specified in the amended Regulations. The amended Regulations also include specific criteria for evaluation of exception requests that will probably make it more difficult to obtain exceptions. The greatest impact of these changes will be on exception requests for: (1) loss of buildable area for new homes on lots created prior to the adoption of the local ordinance; and (2) accessory structures on lots created prior to the adoption of the local ordinance. Where exception requests for loss

of buildable area propose encroachment within 50 feet of perennial streams and contiguous wetlands, they will be subject to a public hearing requirement. All exception requests for accessory structures that propose encroachment in the RPA will be subject to the public hearing requirement. Administrative exceptions will continue to be allowed for other exception requests for loss of buildable area and for exception requests for additions to principal structures in existence prior to the adoption of the local ordinance.

Staff briefed the Board of Supervisors Development Process Committee on March 25, 2002 regarding changes that will be required in order to be in compliance with the amendments to the Regulations. Changes will be required to the Chesapeake Bay Preservation Ordinance, Subdivision Ordinance, Zoning Ordinance and the Public Facilities Manual. Staff is drafting the proposed amendments, for the Board of Supervisor's consideration, with the proposed schedule for amendments to these County ordinances as follows:

- October 2002 - authorization to advertise
- November/December 2002 - Planning Commission public hearing
- January 2003 - Board of Supervisors public hearing
- February 2003 - adoption
- March 1, 2003 - effective date

9. Riparian Projects

Stream bank erosion is a natural process that begins with water movement from uplands. In areas of urban development, impervious (watertight) surfaces replace vegetative soil coverings, resulting in less water soaking into the ground. As a result, more runoff flowing over land surfaces enters streams causing excessive stream bank erosion.

Serious undercutting and sloughing of stream banks can occur when stream banks are not adequately protected by riparian vegetation. This stream bank erosion impacts water quality, causing serious problems for fish and wildlife as well as downstream landowners and communities. Thus water quality and the flora and fauna associated with a healthy stream are closely linked. (See Chapter I, *Water Resources*, for more comments on water quality and stormwater management.)

Many methods exist to stabilize a stream bank. Traditionally, hard structures such as concrete and stone have been the quick fix. These methods may slow down the erosion process but are costly, unattractive, and environmentally objectionable. Today, many engineers and contractors rely on *bioengineering* techniques, which involve the use of living plant materials to stabilize and rebuild soils and vegetation.

Some bioengineering techniques include:

Vegetation -- The stability of a stream bank depends on the establishment of permanent vegetation that can withstand water inundation as well as dry conditions. Live cuttings from willows, dogwoods, and other species that root quickly are incorporated into the soil. Root mass keeps soil in place, and the flexible leaves and branches slow down the flow of water.

Tree revetments -- Large whole trees anchored lengthwise along eroding banks with their bottom ends upstream and overlapping one another may provide continuous protection to the bank.

Biologs -- Biodegradable logs made of processed coconut husk fiber called "coir" can hold soils and plants in place. A biolog is generally eight to ten feet long and about one foot in diameter. The material is tough, flexible, and absorbent. By the time the "log" biodegrades in seven or eight years, a root network of plants has been established through and behind it.

With such innovative bioengineering techniques and proper planning and design, we can restore stream banks, reduce the amount of pollutants and sediment going into streams, improve animal and fish habitat, and create a more aesthetically pleasing environment.

A number of agencies are participating in projects using bioengineering techniques to protect and restore stream valleys. The Fairfax County Park Authority started several projects in 2001 that will affect the biological health of the County's streams.

- The first project to enter the design phase is a reconstruction of the old farm pond at Mason District Park. This project will replace the existing dam, install a new outlet structure, regrade the pond basin and surrounding area, install an overlook at the pond edge, and create a wetland area with boardwalk access. This should control many of the smaller storm events that are currently causing erosion and degradation of the downstream reaches of Turkeycock Run.

- The Park Authority is partnering with VDOT to allow bioengineering restoration-stabilization of approximately 1,500 feet of Turkeycock below the Mason District Park farm pond. This will compensate for impacts associated with the Springfield Interchange project. Restoration will likely begin in late 2003. (VDOT has indicated that they would welcome more opportunities to partner with County agencies on future bioengineering projects.)

- FCPA is undertaking the retrofit of a DPWES storm water management facility upstream from the pond at Hidden Pond Park. Staff is hoping to include

reconstruction of a sediment-filled forebay into an educational wetland and sediment trapping facility.

- Huntley Meadows Park has been affected by erosion resulting from increased runoff due to upstream development for a number of years. Sediments are carried into the park's wetlands, reducing water depth and adversely affecting aquatic life. The Park Authority is working with DPWES on a park bond project in Barnyard Run to use mainly bioengineering stabilization practices to prevent further channel erosion and restore upstream reaches to a healthy condition. The Northern Virginia Soil and Conservation District is providing significant assistance in the design of this project.

The Virginia Department of Forestry (VDOF) has provided forestry related services in Fairfax County for over 30 years. They are also participating in several efforts aimed at improving riparian zones and stream bank stabilization projects.

- VDOF partnered with volunteers from the Chesapeake Bay Foundation, Difficult Run Community Conservancy, Potomac Conservancy, Fairfax County 4-H Clubs, and Nextel Corporation to plant 1,700 seedlings in riparian zones located in stream valleys. The sites of the plantings were Ellanor C. Lawrence Park, Frying Pan Park, Colvin Run Stream Valley Park, and Riverbend Park.

- VDOF sponsored two stream bank stabilization projects. These became joint projects with the Fairfax County Department of Public Works and Environmental Services Stormwater Maintenance Division and the Northern Virginia Soil and Water Conservation District. The projects took place in Wolf Trap Run and Accotink Creek watersheds as follows:

    - In February 2001, NVSWCD, VDOF, and DPWES jointly designed and implemented a stream stabilization project on a 150-foot segment of Wolftrap Run at Cinnamon Creek. The eroded stream bank was threatening a heavily used trail and allowing a huge amount of sediment to flow downstream. The vertical bank was regraded to allow the stream to take advantage of the floodplain during large storms. To protect the stabilized bank, the bottom of the bank was lined with biologs. A flow deflector was built to divert the blow from the bank into the center of the stream.

    - In the fall of 2001, VDOF and NVSWCD held an intensive three-day workshop on streambank stabilization and stream classification, measurement, and restoration at Lake Accotink Park. The site for the field demonstration was a stretch of Accotink Creek below the dam of Lake Accotink. Several bioengineering techniques were demonstrated to protect the banks and improve habitat including biodegradable logs and erosion control matting, shrubs, live stakes and cedar revetments. In

addition, the group learned about structural practices including a-jacks, and rock cross vanes. DPWES and FCPA assisted in the stream work, including providing heavy equipment to regrade the banks of the stream and lift large rocks for the cross vane. (The cross vane structure extends from bank to bank and concentrates the flow in the middle of the stream.)

10. Gunston Cove Ecological Study

Gunston Cove is a tidal freshwater embayment of the Potomac River located approximately 20 miles south of Washington, DC. The Cove is formed by the juncture of Pohick Bay and Accotink Bay, though which the waters of Pohick Creek and Accotink Creek flow to the Potomac River.

An ecological study of Gunston Cove, conducted by the Departments of Environmental Science and Policy, and Biology at George Mason University and supported by the Department of Public Works and Environmental Services, continued during 2000. This study is a continuation of work originated in 1984 at the request of the County's Environmental Quality Advisory Council and the Department of Public Works. This on-going monitoring program was established to determine impacts from local point sources and nonpoint sources and evaluate the status of the Gunston Cove ecosystem. Information from this study is intended to form the basis for well-grounded management strategies for maintenance and improvement of water quality and biotic resources in the tidal Potomac.

The executive summary of the 2000 report by Jones and Kelso summarizes details from their report and covers water quality, phytoplankton biomass, zooplankton, fish larvae and fish, and benthic organisms. The following paragraphs are extracted from this summary.

Chlorophyll a concentrations were typical of recent years with cove values exceeding 100 μg/L during much of the summer and river concentrations being generally below 40 μg/L with some higher peaks. Total photosynthetic rate was consistent with the chlorophyll pattern, but photosynthesis per unit chlorophyll was generally slightly higher in the river. Phytoplankton cell density was very high in late summer, principally due to cyanobacterial cells less that 2 μm in diameter. Biovolume, on the other hand, peaked in mid July in both cove and river. *Merismopedia* was the most numerous cyanobacterium in the cove while *aphanocapsa* was dominant in the river. Diatoms dominated phytoplankton biovolume in the cove through midsummer following which cyanobacteria became dominant. The filamentous centric diatom, *Melosire*, was the most important diatom as in most recent years. *Oscillatoria* was the most abundant cyanobacterium in the late summer and fall. In the river diatoms dominated throughout the year with *Melosira* somewhat less dominant than in the cove.

The large pennate diatom *Surrirella* was found in substantial numbers for the first time in late June in the river.

The rotifer assemblage demonstrated its usual late summer peak with much higher levels in the cove than in the river. *Brachionus* was the overwhelming dominant in the cove with a more mixed assemblage including Conochilidae and *Keratella* in the river. *Bosmina* was found throughout the year with the highest peak in the river. *Diaphanosoma*, on the other hand, exhibited a strong peak in abundance during a restricted period in June and July with somewhat higher levels in the cove, a typical pattern for this larger cladoceran. Other cladocerans also exhibited short periods of increased abundance, normally in the spring. Copepod nauplii were present at relatively high levels throughout the year with the highest densities observed in the summer in the river. While most copepods were present throughout the year, late summer was generally a low point. *Eurytemora* exhibited peaks in early spring and late fall and winter. *Diaptomus* was abundant in spring and early summer. Other calanoids were most abundant in late fall and winter. Cyclopoids were very abundant in 2000 in the river in summer.

Clupeid larvae were more abundant than any other species or other taxon. They were probably *Alosa* sp. (blueback herring or alewife).

White perch made up almost 80% of the catch in trawl samples. The seine catches showed more equitability among species, with four species being abundant. Inland silverside was the most common, but white perch, banded killifish, and spottail shiner were also numerous.

As in most previous years, oligochates were the most numerous benthic organisms with chironomids also important. Several other taxa including amphipods, isopods, snails, and bivalves were found in the river, but not in the cove. One of the bivalves was a native unionid, *Leptodea ochracea*, found for the first time in the George Mason studies of the Gunston Cove area.

The report by Jones and Kelso also exams the data to see what insights can be gleamed into the behavior of the Gunston Cove system and the effects of management activities. Some interesting trends over the period of the study can be seen. Their analysis is extracted and summarized below.

First, in Gunston Cove there was a clear pattern of increase in chlorophyll, a measure of phytoplankton biomass, from 1984 through 1988, followed by a decline through 1997. The same pattern was observed in biochemical oxygen demand (BOD), total phosphorus, and organic nitrogen. Phosphorus loading from the Norman M. Cole, Jr. Pollution Control Plant was greatly curtailed in the early 1980's. The observed pattern in phytoplankton biomass in the cove can be directly tied to the management action to decreased phosphorus loadings if we assume temporary storage of phosphorus during the pre-decrease period which continued to be released in significant amounts for

several subsequent years until largely exhausted or covered by 1989. In addition to the decrease in phytoplankton biomass observed during the 1990's, large scale *Microcystis* blooms disappeared and diatoms, a preferred food source for larger herbivorous zooplankton like cladocera, increased in importance.

Second, there were significant changes in other water quality variables. Chlorine was eliminated from the Norman M. Cole, Jr. Pollution Control Plant discharges in the mid-1980s, removing a major factor inhibiting fish movement in Pohick Creek. Ammonia nitrogen in the cove increased from 1983 through 1989 after which a clear decline was observed through 1995. This has helped to decrease the possibility of un-ionized ammonia toxicity in Pohick Bay.

Third, zooplankton have generally increased in the cove over the 11-year period of consistent data. Since zooplankton are an important link the in food chain between primary production and fish, this suggests a strengthened food chain.

"Fourth, the total catch of fish collected by trawling in the cove has generally declined since the mid-1980's, mainly due to the decline of blueback herring, alewife, gizzard shad, bay anchovy, and the brown bullhead. White perch has remained consistent and strong in the trawl samples."

"Fifth, the total fish collected per seine in the cove has shown little net change, although a dip was observed in the mid-1990's. However, there has been a major change from strong dominance by white perch in the early period to shared dominance by white perch and banded killifish in recent years."

"Sixth, the anadromous catch has increased partially due to increased frequency of sampling. The recent dramatic increase in alewife catches is well beyond that explained by increased sampling effort and reflects a major increase in anadromous fish usage of Pohick and Accotink Creeks."

The report notes some potential linkages between these patterns. The link between phosphorus and phytoplankton seems strong. Thus the decreased biomass and shift to diatoms in phytoplankton populations and the general increase in zooplankton. The consistent performance of white perch is consistent with the cove being a supportive environment, but the reason for decline in other fish taxa is unclear. The increase of banded killifish may simply reflect an increase in habitat as submersed aquatic vegetation (SAV) has gradually increased in the cove.

The annual reports by George Mason University are proving to be very useful in tracking changes in Gunston Cove as a result of changes at the Pollution Control Plant. These changes at the plant have benefited the Cove. The studies should continue so as to get a better idea of long term trends (as thus see the impact of changes at the Pollution Control Plant and other changes that may impact the Cove such as changes in land use in the watershed).

11. Agricultural and Forestal Districts

Landowners may apply to place their land in special Agricultural and Forestal (A&F) Districts that are taxed at reduced rates. A&F Districts, which are created by the Commonwealth of Virginia, must have 200 or more acres. A&F Districts of local significance, governed by the Fairfax County A&F District ordinance, must have at least 20 acres and must be kept in this status for a minimum of eight years.

Fairfax County's policy is to conserve and protect and to encourage the development and improvement of its important agricultural and forest lands for the production of food and other agricultural and forest products. It is also Fairfax County policy to conserve and protect agricultural and forest lands as valued natural and ecological resources that provide essential open spaces for clean air sheds, watershed protection, wildlife habitat, aesthetic quality, and other environmental purposes. The purpose of the Local Agricultural and Forestal District program is to provide a means by which Fairfax County may protect and enhance agricultural and forest lands of local significance as a viable segment of the Fairfax County economy and as an important economic and environmental resource.

Currently, 46 Local and Statewide A&F Districts exist in Fairfax County, containing a total of about 4,095 acres. Table III-5 shows the number and sizes of these A&F Districts. This is an increase of one A&F District in 2001, but a decrease of about 116 acres in this year. This is due to the following:

- Sully: Loss of one Statewide A&F District due to the expiration of the Sappington District on September 16, 2001 (loss of 324.34 acres)
- Dranesville: Gain of two Local A&F Districts, through the creation of one new district, the Potomac Vegetable Farm II District, and the redistricting of one existing district, the Moutoux Orchard District, previously Hunter Mill (gain of 74.65 acres)
- Springfield: Gain of one Local A&F District through the creation of the Kincheloe II District (gain of 176.5 acres)
- Hunter Mill: Loss of one Local A&F District due to the redistricting of the Moutoux Orchard District to Dransville (loss of 43.34 acres)

Before 1983, two Statewide A&F Districts existed containing about 1,260 acres (Mason Neck Statewide A&F District and Potowmack Farm Statewide A&F District). In 1983, local legislation governing Local A&F Districts became effective. Since then about 4,395 acres have been added to the program and about 1,560 acres deleted for a net increase of 2,835 acres. The change in acreage for each year since 1983 is shown in Table III-6.

As can be seen in Table III-5, only four of Fairfax County's Magisterial Districts now contain A&F Districts – Mt. Vernon, Springfield, Dranesville, and Sully. The land in

these A&F Districts contains about 4,095 acres – under two percent of the land in Fairfax County. Mt. Vernon contains the largest acreage of the A&F Districts (about 35%), but this will likely change in 2003. The land comprising the Mason Neck Statewide A&F District was involved in a land swap in 2001. The majority of the acreage in this district (about 804 acres of the total 946 acres) was transferred to the Bureau of Land Management, United States Government. While transfer of ownership does not automatically remove a district from the program, the Mason Neck Statewide A&F District is scheduled to expire on January 12, 2003. At that time, it will likely be removed from the program.

Table III-5
Number and Sizes of Agricultural and Forestal Districts in Fairfax County

Magisterial District	Local A&F Districts		Statewide A&F Districts		Total A&F Districts	
	No.	Size (Acres)	No.	Size (Acres)	No.	Size (Acres)
Braddock	0	0	0	0	0	0
Hunter Mill	0	0	0	0	0	0
Dranesville	19	631.92	1	470.99	20	1,102.91
Lee	0	0	0	0	0	0
Mason	0	0	0	0	0	0
Mt. Vernon	3	188.14	2	1,233.45	5	1,421.59
Providence	0	0	0	0	0	0
Springfield	17	1,111.74	0	0	17	1,111.74
Sully	3	185.52	1	273.37	4	458.89
Total	42	2,117.32	4	1,977.81	46	4,095.13

Source: *County 2001 Agricultural & Forestal District Annual Statistical Report*, Zoning E

12. South Van Dorn Street Phase III Road Project

The U.S. Army Corps of Engineers issued a permit for the construction of South Van Dorn Phase III on May 28, 1996. Conditions contained in the permit require that no construction can start on the roadway until four conditions are completed. Three of these conditions are aimed at protecting Huntley Meadows Park. One condition is that seven parcels of land (102 acres) adjacent to Huntley Meadows Park must be purchased by Fairfax County. This is in lieu of creating wetlands for the five acres of wetlands that will be destroyed in road construction. These 102 acres contain about 69 acres of wetlands and 33 acres of uplands. This action will ensure preservation of the wetlands contained in this 102-acre tract as well as provide a valuable addition to Huntley Meadows Park.

The County now has possession of these seven parcels of land and they will be turned over the FCPA to become part of Huntley Meadows Park. The Corps also required that this land remain natural (as is the rest of Huntley Meadows Park). Unfortunately, some of the land has been mowed. While this land will revert to woodlands if left unmowed, the process can be accelerated by tree planting. An Eagle Scout project is underway to do that in the fall of 2002, using vegetation native to the area. The scout leading this effort will coordinate with Fairfax ReLeaf, Friends of Huntley Meadows Park, Huntley

Table III-6
Changes in Acreage Incorporated in A&F Districts

Year	Acres Deleted	Acres Added	Net Change (Acres)
Pre-1983	0	1,261.36	+1,261.36
1983	0	425.69	+425.69
1984	0	662.41	+662.41
1985	0	169.99	+169.99
1986	55.00	165.76	+110.76
1987	0	0	0
1988	159.78	186.19	+26.41
1989	72.22	459.33	+387.11
1990	100.00	261.77	+161.77
1991	0	631.50	+631.50
1992	287.65	262.60	-25.05
1993	36.17	603.52	+567.35
1994	61.89	33.14	-28.75
1995	0	0	0
1996	36.89	59.18	+22.29
1997	30.32	118.25	+87.93
1998	172.68	22.94	-149.74
1999	55.10	73.67	+18.57
2000	168.89	20.18	-148.71
2001	324.34	207.81	-116.53
Total	1,561.45	5,656.56	+4,095.11

Source: *Fairfax County 2001 Agricultural & Forestal District Annual Statistical Report*, Zoning Evaluation Division, Department of Planning and Zoning, Fairfax County, Virginia, July 1, 2002.

Meadows Park, Fairfax County Department of Transportation, and others to accomplish this.

Another condition by the Corps required stormwater management improvements on eight ponds in and around Greendale Golf Course. All construction is complete with

the exception of one pond. This pond, at the intersection of South Van Dorn Street and King Centre Drive, should be complete in the summer of 2002.

A third condition by the Corps required that Fairfax County submit a Monitoring and Maintenance Plan for these stormwater improvements. The plan details the monitoring and maintenance requirements for a ten-year period.

With the completion of all the conditions imposed by the Corps, construction of the extension of South Van Dorn Street to Telegraph Road should start in the summer of 2002.

C. LEGISLATIVE UPDATE

Two pieces of environmental legislation that address ecological resources came out of the Bolling Commission (Commission of the Future of Virginia's Environment) and were passed into law.

- HB 344 – **Open space special districts**. Allows local governments to create, by ordinance, a service district with the authority to acquire interests in real property in order to preserve open space land. Currently, such service districts are limited to purchasing development rights that are to be dedicated as easements for conservation and open space purposes.

- HB 346 – **Clustering of single family dwellings so as to preserve open space**. Provides that a locality may provide in its zoning or subdivision ordinance standards, conditions and criteria for clustering of single family dwellings and the preservation of open space developments. In establishing such standards, conditions and criteria, the governing body may include any provisions it deems appropriate to ensure quality development, preservation of open space and compliance with its comprehensive plan and land use ordinances. If proposals for clustering of single family dwellings and the preservation of open space developments comply with the locality's adopted standards, conditions and criteria, the development and open space preservation shall be permitted by right under the local subdivision ordinance. The implementation and approval of the cluster development and open space preservation shall be done administratively by the locality's staff and without a public hearing. No local ordinance shall require that a special exception, special use, or conditional use permit be obtained for such developments. However, any such ordinance may exempt developments of two acres or less. In any instance where the proposed density is greater than the density permitted in the applicable land use ordinance, the locality may continue to require approval of a special exception, special use permit, conditional use permit, or rezoning. Localities that currently provide for clustering of single family dwellings upon approval of a special exception shall have until July 1, 2004, to comply with the provisions of this bill.

D. RECOMMENDATIONS

1. EQAC recommends that the County Board of Supervisors develop and implement a Countywide Natural Resource Management Plan – an ecological resources management plan that can be implemented through the policy and administrative branches of the County government structure. Two necessary tasks should be accomplished first -- prepare and adopt a unified Natural Resource Conservation Policy, and complete a Countywide Baseline Natural Resource Inventory. This is a continuing recommendation from past years. EQAC notes that progress is being made in this area due to efforts by the Fairfax County Park Authority staff in their efforts to establish a natural resources baseline inventory. The FCPA has developed a Countywide Green Infrastructure Map that appears to be a Natural Resource Inventory, or at least the basis for it. The Park Authority is also preparing a Natural Resources Plan. This long delayed plan is now scheduled for completion in the fall of 2002. EQAC fully supports these efforts, urging that they culminate in a Countywide Resource Management Plan. This is a continuing recommendation for past EQAC reports. EQACs intent is that Fairfax County should have all the tools in place (the policy and the data) to create a plan that will support the active management and conservation of the County's natural resources.

2. In past Annual Reports, EQAC recommended that the County Board of Supervisors emphasize public-private partnerships that use private actions such as purchase of land and easement by existing or new land trusts to protect forests and other natural resources, including champion/historic trees. With the signing of a Memorandum of Understanding (MOU) between the Board of Supervisors and the Northern Virginia Conservation Trust, such a public-private partnership came into being. Thus EQAC's recommendation has been satisfied. EQAC commends the Board of Supervisors for this action and recommends continued support for this partnership. EQAC notes that the MOU is for a three-year period and therefore recommends continuing this MOU past the initial three years.

3. In reaction to the limited tree preservation authority provided by the County Code, and recommendations by the Tree Preservation Task Force, Fairfax County initiated a proposal to amend the Virginia State Code § 15.2-96 1, as part of its 2002 strong emphasis on tree preservation. Two bills were introduced in the 2002 Virginia State Legislative Assembly, but were tabled until the 2003 session due to opposition by the Virginia Building Association. EQAC recommends that the Board of Supervisors continue to support these proposals to amend the Virginia State Code § 15.2-96 1.

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ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER IV

WILDLIFE AND THE ENVIRONMENT IN FAIRFAX COUNTY

IV-1. IMPACTS OF DEER IN FAIRFAX COUNTY

A. OVERVIEW

The adverse impacts of white-tailed deer in Fairfax County are readily recognized as a problem by many of its residents. While the "problem" is seen from a variety of perspectives, there is a general consensus that the root cause is "overabundance" of deer in many local areas. There is also a general public perception that a deer management program is needed to address the "problem".

The road to an acceptable deer management solution, however, is not so easily determined. Some of the factors essential to a solution are subject to strenuous debate and attract a wide spectrum of opinion. For example, what is the optimum population level, and if population reduction is required, what means shall be used? The sport hunting community, recreational nature lovers, residential property owners, environmental preservationists, and animal rights/welfare groups have differing viewpoints on these issues.

B. BACKGROUND

1. Are Deer Overabundant in Fairfax County?

Caughly (1981) defined four contexts in which the term "overabundance" can be understood when referring to an animal species population. These definitions have since been widely used by most serious scholars in the wildlife management field and by public administrators responsible for wildlife management programs.

1. When the animals threaten human life or livelihood.

2. When the animals depress the density of, or destroy, particular favored species.

3. When the animals are too numerous for their own good.

4. When their numbers cause ecosystem dysfunction.

Where does Fairfax County stand vis-a-vis these four criteria? The available data strongly (even overwhelmingly) suggest that:

1. We experience an unacceptable number of deer-vehicle collisions resulting in deaths, injuries, and major property damage. Owners of commercial agricultural and nursery enterprises suffer substantial damage.

2. In many areas of the County, deer routinely leave their enclaves of "natural"

habitat to forage in nearby gardens and yards causing widespread damage to landscaping and thus major economic loss to property owners. Through voracious browsing, deer are rapidly eradicating numerous threatened and endangered botanical species from the "natural" habitat. In addition, this loss of plant habitat is adversely affecting numerous vertebrate and invertebrate species of smaller physical size, such as many bird species, that are unable to compete with large herbivores.

3. Data for Fairfax County, based on Virginia Department of Game and Inland Fisheries (VDGIF) assessments spanning ten years, indicate that its various deer herds showed a single individual in excellent condition, a very few in good condition, most about evenly split between fair and poor condition, and a few emaciated individuals. This shows quite clearly that no longer can the available habitats meet the minimum nutritional requirements that would maintain the deer population in sound health. A 125-pound deer requires approximately 6.5 pounds of forage per day or some 2,370 pounds of vegetation per year.

4. Many of our parklands and stream valleys show severe browse lines, nearly total eradication of understory, and loss of numerous species upon which the continuous process of woodland regeneration is dependent. These changes in turn lead to the inevitable loss of a wide variety of animal species. Thus, our remaining natural ecosystem is being severely deformed through the eruption of a single species that has become overdominant in the food chain.

According to each of Caughly's four criteria, it is apparent that Fairfax County has a serious overabundance of deer. In recognition of the public perception of a significant problem, the Board of Supervisors directed County staff to develop a plan for deer management. In October of 1997, County staff contracted with a consulting firm to "study and review existing data on deer, deer-habitat interactions, deer-human conflicts, and deer management proposals within the County." Staff also asked the consultants to recommend suitable methods for addressing the various problem areas. These studies and recommendations were presented in the Consultants Report (Natural Resource Consultants, December 1997). In 1998 the County created a new position and appointed a Wildlife Biologist who had broad experience with Fairfax County parks and parkland issues. In the summer of 1999 the County Executive convened an ad hoc Deer Management Committee of experts and stakeholders to discuss and evaluate the plan drawn up by the staff and the early implementation efforts. The report of this committee and its recommendations were forwarded to the Board of Supervisors in September 1999 in advance of the season of peak deer problems, which occurs in the fall. The Board of Supervisors approved recommended measures to reduce the deer population to more sustainable and less destructive levels. Since then, the deer management program has made substantial progress in achieving significant population reductions in some of our most threatened parklands.

2. A Description of the Problem

a. Data on Deer Abundance in Fairfax County

To begin this discussion, the terms overabundance and overpopulation should be distinguished. Overabundance refers to population levels that have adverse impacts on the community and other species, while overpopulation refers to population levels of the species that are an imminent danger to itself through disease and starvation. This latter phenomenon is responsible for the population eruption and subsequent collapse of deer herds that has been a topic of scientific study for the past 60 years. While the following information supports a conclusion that deer are overabundant in Fairfax County, neither the data nor experts from a variety of sources have indicated that a level of overpopulation exists, though the relatively poor health of the County's deer suggest that we may be approaching overpopulation.

Data from the Virginia Department of Game and Inland Fisheries deer density surveys in Fairfax County parks prior to the County's deer management program showed deer densities from 90-419 deer/sq. mile (Table IV-1-1).

Table IV-1-1
Deer Density Surveys

Location	Est. Deer/Square Mile
Huntley Meadow Park	90-114
Riverbend Park	213
Meadowlark Gardens Park	90-115
Bull Run Regional Park	419
Fort Belvoir	90
Mason Neck NWR	-

(Source: W. Dan Lovelace, Wildlife Biologist, Virginia Department of Game and Inland Fisheries.)

While the many of the data are limited, taken collectively, the observations of

professional park staff, poor health of evaluated deer, and high deer densities indicate that deer are overabundant and are negatively impacting the ecology of sizeable areas of Fairfax County. Unfortunately, there are few reliable data available for densities and extent of damage on private lands and the adjacent small islands and corridors of natural habitat. Even though the information available is primarily anecdotal, it is voluminous, and there is a general public perception of a significant and growing problem of deer overabundance.

b. Causes of Overabundance in Urban/Suburban Areas

i. Urbanization/Changes in Habitat

Over recent decades Fairfax County has transformed from a largely agrarian and woodland area to a multifaceted employment, residential, and retail area. Nearly 1,000,000 people reside in the 399 square miles of the County. Of this 399 square miles about 140 square miles is wooded and open land and some three square miles is remaining agricultural land. This change from an agrarian area to a developed one has markedly decreased the amount of land usually regarded as suitable for deer habitat and has changed their food sources and movement patterns. This urban/suburban habitat of the County provides a fairly good nutritional base for deer, including manicured lawns, athletic fields, college campuses, golf courses, and landscaped residential communities.

Overabundance is particularly common where the course of development has left protected "islands" or "corridors" of deer habitat in or near urban and suburban areas. As the development process reduces the area of natural habitat, deer are forced into these remaining islands and corridors at very high population densities. Because the deer then deplete the forage plants in these enclaves, they venture out into the surrounding developed community in search of food. In such situations, conflicts with humans frequently arise in the form of deer-vehicle collisions and depredations on gardens and ornamental plantings (Flyger et al, 1983; Cypher & Cypher, 1988). Moreover, in such situations, natural predators (e.g., wolves, bobcats, mountain lions) have normally long since been eliminated and hunting is usually prohibited.

ii. Loss of Predators

The precolonial levels of deer in Virginia could be attributed to predation by bobcats, black bears, eastern gray wolves, and eastern mountain lions, in addition to the number taken by Native American hunters. While none of these predators depended solely on deer, the deer/predator interactions and the added effects of hunters kept the population levels low and well within the carrying capacity of the land. Increasing human populations and land development has virtually eliminated

wildlife predators from the County. In the first half of this century, hunting had reduced the deer population to very low levels. However in the latter half of this century, with growing human population and reduction of huntable habitats, recreational hunting has almost disappeared in the County. While the number of deer harvested through "Out of Season Kill Permits" has increased in recent years (Table IV-1-2), the combination of seasonal hunting and out-of-season kill permits does not affect the deer population at sufficient levels to prevent significant deer/human conflicts or ecological damage.

Table IV-1-2
Out of Season Kill Permits Issued For Deer Damage in Fairfax County
Virginia Department of Game and Inland Fisheries

Year	Permits	Number Taken
1989	5	25
1990	3	4
1991	19	41
1992	18	43
1993	42	222
1994	31	131
1995	65	193
1996	165	244
1997	147	310
1998	157	297
1999	216	377
2000	197	263
2001	148	398

(Source: Mark Pritt and Jerry Sims, Wildlife Biologists, Virginia Department of Game and Inland Fisheries.)

It should be noted that while the number of out-of-season permits has declined markedly in 2001, the number of deer taken has increased even more dramatically. This is quite consistent with intensification of problems in a smaller number of

areas as land clearing for development squeezes the deer population into smaller and more isolated patches of habitat.

c. Problems Created by Overabundance

i. Ecological Impact

Effects of a persistent and overabundant deer population include the loss of biodiversity and a negative effect on ecological and biotic systems. These can be seen in a declining understory (lower height plants and shrubs that serve as a food source for birds) and the appearance of browse lines, which occur when deer eat almost all the vegetation within their reach and the woods develop a "line" at the top of their reach. While few detailed deer/forest impact studies have been performed in the County, in a report to the Division of Animal Control, Fairfax County Police Department, the Superintendent of Administration of the Northern Virginia Regional Park Authority noted that "the ever present browse line had now become a common sight in most of our parks. The deer have eaten all of the herbaceous and woody plant growth within their reach. This has eliminated an entire stratum of habitat from the parks."

The browse line and loss of understory are not the only indications of this ecological impact. There is an abundance of technical literature reporting the effects of a high deer population on plant communities when the lower ecological carrying capacity (see page 10) is exceeded. However, the apparent poor health of the County's deer indicates a level of deer density that reportedly exceeds even the higher biological carrying capacity. There are also numerous studies documenting the negative effects of overabundant deer on wildlife species. For other vertebrates, this may occur through direct competition for food sources or more often by altering the habitat. For example, in some areas of the County the number of species of birds has markedly diminished through loss of the necessary habitat due to excessive browsing by deer.

As noted in the 1997 Consultant Report and throughout the scientific literature, "The consequences of a persistent, overabundant deer problem can be long-term loss of biodiversity and negative impact to functioning ecological and biotic processes." We have already begun to see a loss of biodiversity that will ultimately lead to a loss of ecosystem stability with far more widespread and serious effects than the shorter-term effects of overabundant deer.

ii. Property Loss and Damage (Vehicular, Plantings)

There currently is no accurate system to track data regarding the total property loss due to deer/vehicle collisions. The Fairfax County Police Department does an

excellent job of analysis of the data on deer-vehicle collisions that require a police presence in their aftermath or that are otherwise reported. The numbers appear to have increased, but the data (Table IV-1-3) do not show a consistent trend. For those accidents tabulated from January 1998 through May 2001, the average damage per vehicle was about $2,300 ($2,111 for CY 2001). Over this same period, the Virginia Department of Transportation picked up 3,450 carcasses of deer killed in vehicular collisions from rights-of-way in the County. In 2001, VDOT picked up 870 deer carcasses from the roadway and immediately adjacent right-of-way in Fairfax County, which represents a significant decrease from earlier years. At least part of this decrease may be attributable to the County Deer Management Program, while part may be normal secular variation.

Table IV-1-3

Deer-Vehicle Collisions in Fairfax County

Year	Non Injury	Injury Crashes	Fatal Crashes	Total
1993	154	6	0	160
1994	149	10	0	159
1995	127	6	0	133
1996	157	20	0	177
1997	168	17	1	186
1998	144	23	0	167
1999	177	18	1	196
2000	144	17	0	161
2001	143	22	0	165

(Source: Report prepared by Michael Uram, Fairfax County Police Department.)

Police and highway experts estimate that only 20-25 percent of deer impacting vehicles die at the scene (i.e., on the road or in the right-of-way); many receive injuries that are soon fatal, but die in the woods or in a nearby yard. Thus, a reasonable estimate would indicate some 13,800-17,250 deer-vehicle collisions in the County during the 1998-2001 period. One can reasonably infer that many, if

not most, of these collisions result in property damage to the vehicle.

County personnel report an increasing number of complaints of damage to native and ornamental plants in Fairfax County. Referring again to the "Out of Season Kill Permits Issued for Deer Damage" (Table IV-1-2), an indication is given of homeowner attempts to address property loss primarily thought to be ornamental in nature. Further, although numerous deer management programs are available, such as planting less preferred species and fencing, the effectiveness of these methods declines dramatically with increased deer densities leading to declining food sources and willingness of deer to eat even undesirable plants. These activities may also tend to increase vehicular incidents as deer must look farther afield for food sources.

iii. Disease

Another problem associated with deer overabundance is the prevalence of Lyme Disease. See Section IV-3 below in this chapter for a discussion of Lyme Disease.

C. ISSUES IN ADDRESSING THE PROBLEM

To effectively manage the deer population, the implications and interrelationships of population dynamics, carrying capacity, public opinion, and methods for management must be understood and incorporated into the program.

1. Understanding Population Dynamics

The concept of population dynamics is crucial to understanding the current problem and the development of a workable solution. There are no simple mathematical models that can be applied to determining the growth of the population of a species in a particular area, and the least complex deer management models and programs based on solely on nutritional deer carrying capacity (see section on carrying capacity below) consider neither the deer population's interactions with the human population nor its interactions with a biodiverse ecosystem.

One important concept to understand is that of home range. Deer show a strong attachment to a home range, and it has been shown that deer forcibly relocated often die of malnutrition even if food is accessible in their new habitats. When natural dispersal from the home range occurs, it is usually the younger males that migrate. This has four implications for Fairfax County deer management:

1. Deer often occupy a home range that can include both a park and the surrounding community or islands and corridors of "natural" habitat plus the yards and gardens of adjacent residential communities;

2. A dramatic decrease in one area will not necessarily result, in the short term, in an increased dispersal of deer from other areas into the depleted area, with a consequent lessening of population density in those other areas;

3. Deer cannot be eliminated from the County under today's conditions, because the deer surviving in surrounding home ranges will, in the long term, undergo natural dispersal and repopulate the depleted areas. This implies that parks and the surrounding areas must be managed as a unit and that solving the problem in one area does not automatically translate to another area; and

4. The recent emergence of epizootic hemorrhagic disease (EHD), a viral disease fatal to deer but posing no threat to humans, may be a significant factor in natural reduction of the deer population over the next several years. EHD has sometimes been implicated as a significant factor in the boom-bust cycle observed within deer populations that have been the subject of long-term study. Within the past year, 53 deer fatalities due to EHD have been diagnosed in the southeastern portion of the County, and these diagnosed cases probably represent only a small fraction of those succumbing to the disease. Weather, the size and compactness of deer herds, and the overall health of the deer play a major role in EHD transmission. Thus, it is not possible to predict the future course of this disease within the County, except to note that it usually takes several years to run its course within a deer population and we appear to be in the early stages of an outbreak.

Other concepts that affect population dynamics include compensatory reproductive responses, survival, and predation. Again, it must be noted that deer management is not a simple mathematical equation; it must take into account many biological and behavioral factors, many of which are not fully understood, especially in an environment such as Fairfax County. For example, in many cases, as the size of an animal population decreases, the number of offspring increases despite the fact that food is becoming less adequate. This phenomenon leads to the population eruption-crash cycles that are widely discussed in the scientific literature. More complete data and an improved understanding of the unique characteristics of Fairfax County must be collected and considered as the management program evolves.

2. Determining Carrying Capacity Goals

Carrying capacity is the level of a population that can be supported by an ecosystem or tolerated by the community. To determine the appropriate population level as a goal for a management plan, it is essential to distinguish among the following:

1. Biological carrying capacity, i.e., a species specific level that is primarily

concerned with the population that can be supported with the available nutritional resources;

2. Cultural carrying capacity, i.e., a level that is driven by human concerns (the population that can be tolerated by the community at large); and

3. Ecosystem carrying capacity, i.e., the population level that can be supported by an ecosystem without disturbance of its stability or reduction of its biodiversity.

The biological carrying capacity is a traditional view that has been widely used by fish and game departments where a primary concern is to maintain adequate stocks of deer for sport hunting, but it does not adequately account for the effects of relatively high population levels on the ecosystem in which the species resides. The cultural carrying capacity is defined by Ellingwood and Spingnesti (1986) as the maximum number of deer that can coexist compatibly with local human communities before conflicting with some human interest. This level is driven by human values, economics, and desires independent of ecological considerations. DeCalesta (1998) used the term diversity carrying capacity in a more restrictive sense than ecosystem carrying capacity, but both concepts consider the maximum species population density that does not negatively impact diversity of fauna or flora, including diversity of habitat structure as well as species richness. He contends that deer impacts on biodiversity occur at population densities well below traditional definitions of ecosystem carrying capacity.

Thus, biological carrying capacity is the highest population density and is considerably in excess of cultural carrying capacity (human societal tolerance), which in turn accepts notably higher densities than ecosystem carrying capacity. Finally, diversity carrying capacity has the smallest maximum population density.

3. Considering Public Opinion

Goals for management and methods to use to reach those goals are very different issues; consensus or conflict among groups of constituencies may occur at either or both levels. Goals may vary from a biological carrying capacity level that meets hunting concerns to a much lower carrying capacity level based on an ecological or biodiversity perspective. Cultural carrying capacity may run the gamut of levels, depending on the varying values and tolerances of different constituencies within the community. Even where there is agreement on the level of deer density desired, the methods to reach those goals may be in dispute. Some groups may have a zero-tolerance for lethal means, whereas others may readily support managed hunts or sharpshooters.

As indicated in the 1997 Consultant Report, deer control action by the County should not be undertaken until it is determined that there is sufficient community and political support for it. Again, the need for data, this time in the form of public opinion surveys, is stressed.

Additionally, the need to adequately educate the public about the issues is needed to ensure well-informed constituent responses.

D. METHODS FOR DEER POPULATION MANAGEMENT

1. Population Reduction Approaches

a. Let Nature Take its Course - Eruption/Collapse

This approach is based on using no human intervention to affect the deer population one way or the other. This has been studied by wildlife biologists for more than half a century. The findings are that the population goes through an eruptive phase with explosive population growth until it is far above biological carrying capacity. This is followed by eruptions of parasitic and infectious diseases (such as EHD) and by large-scale starvation, which causes the population to crash to perhaps 15-25 percent of its peak level. Thereupon, the herd recovers to begin the cycle anew. Some populations have been followed through five or six successive cycles. Although the deer population of Fairfax County can be considered to be in the early stages of the eruptive phase, it is well short of a peak. Public concerns about the current and expected future impacts on the community rule this out as an option.

b. Lethal Methods

i. Managed Hunting

Experiences with managed hunts over the past year indicate they have been highly cost effective in that revenue has exceeded costs for personnel and materials. This is in sharp contrast to their initial use in1998 when costs were high and relatively few deer were taken. The dramatic upturn in the learning curve is very encouraging. Necessarily, managed hunts are conducted primarily in parkland, and while the amount of deer population reduction in these local areas is no doubt ecologically beneficial, in terms of absolute numbers it has been insufficient to make an immediate noticeable difference in the overall problem.

ii. Archery Hunting

Archery hunting has proven an effective and acceptable means of deer control in residential areas where use of firearms is deemed too hazardous. Archery is a quiet and short-range method, with most deer being taken within less than 100 feet. During the 1998 public hunting season, 789 deer were taken in Fairfax County, of which 597 were taken by archery and the remainder by shotgun. In 1999 archery accounted for 686 of the total of 1046 deer, and in 2000 accounted for 626 of 1028 deer. With out-of-season kill permits, archery can be used year-round even in

residential neighborhoods.

iii. Traditional Public Hunting

Under current restrictions outlined by VDGIF, the above figures show that traditional public hunting is not sufficient to address the problem, based on hunters' limited access to deer habitat and preference for antlered deer. Moreover, the habitat that is accessible is not where the major problem areas are located.

iv. Trap and Kill

This method has usually been conducted by darting with anesthetics and dispatching the animal by gunshot or a lethal drug. The former is less effective than sharpshooters while the latter leaves the meat unfit for human consumption. The use of drop nets and stun guns are explained in the 1997 Consultant Report as a possible lethal method. This method allows for release of non-targeted males and results in meat uncontaminated by drugs but is very cost inefficient.

v. Sharpshooters

The use of professional animal control personnel, police experts, or qualified and experienced volunteers has been proved to be a safe, cost-effective, and successful means of management if lethal methods are employed. Earlier experience with this method in Fairfax County has led to significant refinements and greatly improved cost-effectiveness, with a cost per deer taken ranging from $4.15 to $22.97. Once again, the number of deer removed from the population by this method is not sufficient to have more than a modest local effect.

vi. Reintroduce Predators

The reintroduction of the usual species of deer predators into an urbanized setting such as Fairfax County is biologically unworkable and publicly unacceptable.

c. Nonlethal Methods

i. Trap and Relocate

Experiments with this approach have been largely unsuccessful due to high initial mortality (up to 85%) of the relocated deer. Moreover there are few locations within a reasonable distance of this area that would accept relocated deer, since most nearby areas have similar problems. The use of drop nets and stun guns are suggested in the 1997 Consultant Report as a possible method for deer capture.

More traditional methods use anesthetic darts. This method is considered infeasible for Fairfax County.

ii. Contraception

Steroidal/hormonal contraception has proved very costly and difficult to implement and only very marginally effective. Immunocontraception, on the other hand, holds some promise for deer management, but it is currently in an experimental stage. The Humane Society of the United States is conducting field studies at the enclosed National Institute of Standards and Technology site in Montgomery County, but due to difficulty with marking deer, the Humane Society is not yet conducting studies for free-ranging deer such as those in Fairfax County. The recent technical literature discusses requirements for sites chosen for pilot tests. All indications are that this is not a near term solution for the County but might hold promise for limiting populations in the future, once they have been reduced to desired levels.

2. Conflict Mitigation Approaches

Conflict mitigation is directed toward reducing the direct impacts of deer on the human population and thereby increasing the tolerance of the community for the existing deer population.

a. Supplemental Feeding

Conceptually this approach is supposed to divert deer from the landscape plantings in gardens and yards. Supplemental feeding might somewhat improve the health of the existing deer population but would almost certainly drive it to even higher levels. Thus, consideration of this approach would be counterproductive for Fairfax County since it does nothing to reduce the excess deer population.

b. Fencing

Fencing is only rarely effective since deer are noted for leaping even eight foot fences. Thus, fencing is a costly and ineffective solution, especially when deer are seeking out preferred plant species.

c. Repellants

Repellants have had some limited success but are generally costly and most require frequent replenishment. Also many of them have odors that are no more acceptable to humans than they are to deer.

d. Roadside Reflectors

Roadside reflectors divert light from vehicle headlights toward the sides of the roadway and are intended to frighten the deer away from the road thereby reducing the likelihood of vehicle collisions. The method is useful in the evening and early morning hours when the majority of deer-vehicle collisions occur. While expensive this technique has shown some promise in tests. The Virginia Department of Motor Vehicles has given the County a $40,000 grant to conduct studies of the effectiveness of roadside reflectors. The first test site was a section of Telegraph Road that has had a high incidence of deer-vehicle collisions. The initial results show promise but are confounded by three other factors: (1) construction activity in the area may have driven many deer away, (2) a high incidence of epizootic hemorrhagic disease that may have naturally reduced the population, and (3) an archery hunting program at Fort Belvoir that definitely reduced the population in that area. The County staff have identified and begun testing at additional test sites, but these also have problems that render data interpretation extremely difficult.

e. Underpasses

Construction of underpasses has been suggested as a way of providing deer with a safe means of getting to the other side of busy roads. Not only is it exceedingly costly, but there are no data available now or expected in the future that would pinpoint likely sites. This approach is regarded as wholly impractical.

f. Use of Less-Favored Plants

Landscaping with plant species that are less favored by deer has been advocated as a way of reducing depredation of yards and gardens. However, as Cypher & Cypher (1988) and numerous other wildlife biologists have shown, when deer populations exhaust the preferred plant species they readily turn to those less-preferred. Thus, in the short term this approach might seem to work but longer term experience indicates that it is relatively ineffective.

E. PUBLIC EDUCATION PROGRAM NEEDS

As noted above, an educated public that has an understanding of the population dynamics of deer, the concepts of carrying capacity, the different management options, and an understanding of the various values of the community in addressing ongoing management is essential to the successful implementation of a deer management program. The recommended public education program should encompass the following:

- The County Deer Management website **(www.co.fairfax.va.us/comm/deer/deermgmt**

.htm) already serves as a primary vehicle for making much of the information mentioned below more readily available and updatable.

- Develop pamphlets that are easily read, easily mailed, available through various County offices and through the local Supervisors' offices. These should include information on:

  - Deer and deer biology.
  - Ecosystem and population dynamics in general, and as they relate to the interaction between deer and other species of both plants and animals.
  - Methods of population management, including their relative feasibility and cost-effectiveness for achieving both short-term and long-term goals.
  - The deer management program.
  - Permits required for implementation of private control measures.
  - Fencing and repellents.
  - Safe driving and how to avoid deer on the road.
  - Lyme disease and its prevention (See Section IV-3 of this report).
  - Who to contact for additional information.

- Establish networking among the following agencies for provision of consistent public information:

  - Fairfax County Government offices.
  - Fairfax County Supervisors district offices.
  - Fairfax County Animal Control Division.
  - Nature Centers.
  - Health Departments.
  - State agencies, particularly Virginia Department of Game and Inland Fisheries and the Virginia Department of Transportation.
  - The Humane Society.

- Compile and make available a comprehensive bibliography of literature on deer management in urban environments. (The references attached to this section provide a limited example.) Make this information available to schools, civic and technical groups, and interested individuals.

- Establish an archive of evidence documenting how deer can change the characteristics of a landscape. This should show:

  - Habitat characteristics before deer damage.
  - Habitat characteristics during and after deer damage.
  - Habitat characteristics during regeneration after deer population is reduced.
  - Statistics and trends for vehicle/deer collisions, number of injuries/fatalities, and types of damage.

- Create a visual display of the above for use at schools, fairs, libraries, etc., and develop

presentations for use at public meetings and meetings of civic groups.

- Establish a County self service telephone number for wildlife problems and public information. This could be a menu driven hotline that would direct people to the proper location on the information network or to the appropriate County office.

F. PUBLIC AGENCY RESPONSIBILITY

The Division of Animal Control of the Fairfax County Police Department has been assigned primary responsibility for deer management by the Board of Supervisors. However, due to the legal concept that ownership and disposition of wildlife is vested in the state, the Virginia Department of Game and Inland Fisheries exercises significant regulatory and permitting functions that affect Fairfax County's deer management activities. The Division of Animal Control, in coordination with applicable land-holding agencies (e.g., Northern Virginia Regional Park Authority, Fairfax County Park Authority) and other public authorities, implements the Integrated Deer Management Plan on public lands. In addition, the Division of Animal Control advises private business and residents in addressing deer management on privately owned parcels in Fairfax County. Deer management on federally owned tracts of land within Fairfax County (e.g., Mason Neck National Wildlife Refuge, Fort Belvoir, etc.) is the responsibility of the respective federal agencies and is subject to the applicable federal policies and regulations.

G. PROGRAM IMPLEMENTATION ACTIVITIES

An Integrated Deer Management Plan was developed by County staff subsequent to the Consultant Report received in December, 1997. The Board of Supervisors in November, 1998, directed that program implementation activities commence. Subsequently, in the summer of 1999 the County Executive convened a Deer Management Committee comprised of experts and various stakeholders to evaluate the plan and initial implementation efforts and to prepare recommendations for the Board of Supervisors for further implementation of the plan during the fall and winter of 1999-2000. This committee meets annually to review progress in program implementation and to make recommendations on additional approaches. The Division of Animal Control of the Police Department prepares the annual Fairfax County Deer Management Report to the Board of Supervisors that contains extensive data on the program. Additional material is located on the County website (www.co.fairfax.va.us/community/deer) On December 8, 1997, the Fairfax County Board of Supervisors approved managed hunts for Riverbend Park and the Upper Potomac Regional Park, both in the Dranesville District. Plans by the Animal Control Division were approved by the Northern Virginia Regional Park Authority and the Fairfax County Park Authority for four managed hunts for each of the two

locations. The hunts were planned for January and February of 1998. The managed hunts conducted in 1998 were largely unsuccessful in achieving planned program objectives and had associated costs that were difficult to justify. However, some of these costs could be attributed to greater-than-necessary safety measures that experience now indicates would not be needed in the future. In contrast, four managed hunts, involving 132 hunters, conducted in the fall and winter of 1999-2000 were very cost effective, with 195 deer taken at a cost per animal of $9.51. The seven managed hunts conducted in the fall and winter of 2000-2001 involved 223 hunters, who took a total of 351 deer at a cost per animal of $17.94. Of the 351 deer taken, 222 were donated to a program that feeds needy families. For 2001-2002 hunt season the program returned a profit of $7.28 per animal because the permit fees collected exceeded program costs.

The sharpshooter program, which utilizes Police Department Special Operations tactical teams, has been cost-efficient from the outset. These teams must engage in extensive marksmanship training on a regular basis in order to maintain the required proficiency. Instead of practicing on a target range, they are utilizing this required training time in a field setting with the deer more closely resembling operational targets. The harvested deer are collected by a charitable organization that provides meals to the needy. Even in the early part of the learning curve, this program has shown satisfactory harvest rates. Whereas, similar programs in most mid-Atlantic jurisdictions have harvests listed in hours per deer taken, Fairfax County in 2000 had a harvest rate of 1.54 deer per hour. From late December 1999 through late January 2000, fourteen sharpshooting sessions over a total of 41 hours were conducted with a total harvest of 89 deer at a cost of $4.15 per animal. In the same period of 2000-2001 there were 23 sharpshooter sessions, totaling 94.75 man-hours, which took 146 deer, at a cost per deer taken of $22.97. In 2001 the cost per animal rose to $44.99 if all costs were attributed solely to the Deer Management Program, but this would be fallacious due to the fact that this activity represents proficiency training for the police tactical units which must be conducted anyway. A major reason for this increase in cost per animal is that most of the sites this year represented repeat visits to locations first addressed last year and the year before. As the herd population density decreases, the time expended on each animal increases, and this is further increased by the increased wariness of the surviving members of the herd. Thus, the costs are very much in line with expectations and will drop once again as more new sites are brought into future years' mix of new and old locations.

Clearly, the managed hunt and sharpshooter programs must be conducted largely in parkland due to safety considerations, but this is also where some of the most substantial benefits are to be achieved. From the outset, the Northern Virginia Regional Park Authority has taken a position of active involvement and has reaped corresponding benefits. The Fairfax County Park Authority has been slow to become actively involved and avail itself of the clear benefits offered by the program to the ecology of its parks. It is to be hoped that in the upcoming deer management season the Fairfax County Park Authority Board and executive staff will much more directly involve the FCPA in the program and thereby exercise the ecological stewardship that is so necessary to the biotic health of our parks and parkland.

Out-of-season kill permits have, for some years, been one of the few legal avenues open to private property owners to permanently remove deer that are causing serious damage to their properties. Such permits are issued by the Virginia Department of Game and Inland Fisheries after verification of the damage. Generally, however, permits are only issued for holders of larger property parcels because of safety considerations. Fairfax County should work in coordination with the VDGIF to make these permits available on a wider basis to qualified residents.

The use of roadside reflectors (strieter-lite technology) that reflect automobile headlights into wooded areas bordering the roadside has been suggested as a method of discouraging deer from crossing roadways in the evening and early morning hours when most deer-vehicle collisions occur. In mid-November 1999 the Board of Supervisors approved $10,000 for a pilot program to test strieter-lite reflectors in selected locations. In addition, a grant of $40,000 was received from the Virginia Department of Motor Vehicles for testing and evaluation of this technology at several locations in Fairfax County. Unfortunately, all of the test locations experienced confounding factors such as roadway modification, adjacent development, deer herd reduction through hunting and disease, etc, that made it impossible to draw reliable inferences from the collected data. In addition, the manufacturer of the reflectors has apparently discovered that the initial design was reflecting light in a part of the spectrum to which deer's eyes are relatively insensitive, and the design is now being changed. Such inferences as can be drawn from the data suggest that there is only a slight reduction in deer-vehicle collisions due to the use of reflectors. This conclusion appears to be borne out by tests in other eastern areas where there was an absence of confounding factors. The tests in Fairfax County have shown this technology to have so little promise that it cannot be recommended for continuance.

Even though Fairfax County hass not conducted a pilot project to test the feasibility of immunocontraception, this technology has shown a limited potential for the future. A program being conducted by the Humane Society of the United States on the campus of the National Institute of Standards and Technology in Montgomery County is being carefully monitored for possible applicability to Fairfax County. After the deer population has been reduced to generally acceptable levels, this methodology might provide a feasible method of sustaining these levels in some local herds for the long term. In mid-November, 2000, the Board of Supervisors approved $10,000 to develop a pilot demonstration program on deer contraception.

H. CONCLUSIONS

The need for a comprehensive deer management program for Fairfax County does not appear to be in serious dispute. However, there is perhaps a somewhat wider array of opinion about the appropriate context for determining carrying capacity level for the management program and the particular methodologies to employ in reaching program goals.

As noted in much of the reference literature, deer have traditionally been viewed as livestock and woodlands and meadows as pasture. Deer management models and programs have been based largely upon nutritional deer carrying capacity that does not consider issues of biodiversity, altered natural processes, natural herd demographics and behavior, or adverse impacts on mankind. The discrepancy of views can be seen in comparing a report by the Virginia Department of Game and Inland Fisheries with the recent Consultant Report. The VDGIF report states that deer densities ranging from 90-419 deer per square mile have been reported in various County parks and that ideal deer densities are 15-20 deer/sq. mile of suitable habitat. However, the 1997 Consultant Report and much of the scientific literature argues that a deer density of no more than 8-15 is required to meet a biodiverse goal of deer management. Many of the assumptions upon which the Integrated Deer Management Plan for Fairfax County is based need to be validated by further environmental assessment of the County and reconciled with more precisely defined ecological goals.

It is evident that, while deer in Fairfax County have not reached a state of overpopulation (as earlier defined), they are near biological carrying capacity as shown by their poor physical condition and their relentless foraging outside their "natural" habitat. It is equally evident that, for the majority of citizens, deer have greatly exceeded cultural carrying capacity in terms of representing a serious vehicular hazard and their depredations on both private landscaping and our public parklands. There is now substantial evidence documenting the fact that ecological and biodiversity carrying capacities have long since been exceeded.
In light of the Environmental Quality Advisory Council's role as an advocate for protection of environmental quality, it is EQAC's view that a biodiversity approach is needed in Fairfax County. However, as cautioned in the 1997 Consultant Report, EQAC too cautions against attempts to move forward with a response without adequate data, a clearly articulated plan, and education and consensus building of all major stakeholders. While moving quickly may assuage the concerns of some vocal groups, a true solution must address the problem with a long-term approach, considering all major stakeholders. Management must address an ecological goal that is based on sound science and considers the value system of an educated community.

All of these caveats having been noted, the problem has now reached such proportions that every feasible approach must be employed not only to keep the burgeoning deer population in check, but more important, to systematically reduce it to sustainable levels. It is evident that the current managed hunt and sharpshooter programs have reached an admirable level of cost-effectiveness but are not reducing the Countywide deer population at a rate sufficient to achieve the recommended biodiversity carrying capacity. Thus, it is incumbent upon the Board of Supervisors to continue to take increased and decisive action to address this problem over the long term, while recognizing that it is not going to be possible to please all of the people all of the time. It is likewise incumbent upon the Fairfax County Park Authority to actively participate in the deer management program in order to exercise the necessary stewardship of the ecological well-being of the County's parkland.

I. RECOMMENDATIONS

1. EQAC recommends that the Board of Supervisors continue to implement and monitor the comprehensive deer management program set forth in the Integrated Deer Management Plan adopted in November, 1998 and refined by the Deer Management Committee in the summer of 1999 and in subsequent periodic meetings. EQAC strongly supports the following broad goals encompassed in the plan and in the subsequent studies and evaluations:

    - Management based on reduction of local deer populations to sustainable levels.

    - Management based on a sound ecological approach that emphasizes biodiversity without preferential treatment of particular species.

    - Management based on an "in perpetuity" perspective that does not trade long-term interests for short-term gains.

    - Protection, restoration, and enhancement of the natural areas and environments that have been subjected to degradation by deer overabundance.

2. EQAC strongly endorses on-going public input into the plan including surveys of public opinion and the inclusion of major stakeholders (home owners, environmental preservationists, public safety experts, wildlife biologists, public health experts, sport hunting groups, animal rights groups, etc.) in the refinement and implementation of the plan. EQAC fully supports continuation of both the input of a broad range of views and the use of spokespersons who can articulate program goals and the ongoing management approach to the varied community groups and viewpoints.

3. EQAC strongly commends active participation of the Fairfax County Park Authority in the deer management program in order to provide improved stewardship of the parks, golf courses, and other parklands under its care and management. To this end EQAC requests the Board of Supervisors to share with the Park Authority EQAC's concern about the current deer population levels in some of the County parklands.

4. EQAC feels that, in addition to the measures implemented on public lands, the management program must address the problems of small private (mostly residential) property owners who are suffering serious impacts from deer and develop means for them to legally exercise effective control measures.

5. EQAC feels that the management program must accomplish the following key objectives:

    - Immediate and sustained measures for reduction of the deer population in order to return the size of the local herds to levels consistent with the long term carrying capacity of their

particular local habitats.

- Ongoing monitoring of availability of methods for maintaining population limits over the long term, such as immunocontraception and other experimental methods.

- Consideration of development in the County and its effects on ecosystem health and biodiversity as these relate to deer management as well as to the quality of life generally.

6. Since public acceptance of management programs is more easily achieved when there is full public understanding of the problem, the available management options, and their costs and other consequences, EQAC strongly recommends that the Board of Supervisors continue to provide for a vigorous program of public education as is now being done by the Division of Animal Control and on the County website.

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Pat McElroy, Wildlife Biologist, Humane Society of the United States.

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Harriet Calloway, R.N., Epidemiologist, Fairfax County Health Department.

Linda Smith, Fairfax County Health Department.

Todd Bolton, Natural Resources Manager, Fairfax County Park Authority.

LIST OF REFERENCES

NOTE: Most of the references listed below contain extensive bibliographies. The two symposia of 1997 contain between them 83 papers, each with its own separate bibliography, which, in the aggregate, offer hundreds of additional references for those wishing more detailed information on a variety of specific topics.

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IV-2. IMPACTS OF GEESE IN FAIRFAX COUNTY

A. OVERVIEW

Canada geese, once almost exclusively migratory, have to an increasing extent become year-round residents in Fairfax County. Although these resident populations are not evenly distributed throughout the County, many of our ponds and lakes, both large and small, and their adjacent shore areas have been occupied as permanent habitat. Geese have also become an increasing problem on parkland, golf courses and similar facilities. The problem is not so much the animals *per se* but rather the fecal contamination they bring to our water bodies and watercourses and their fouling of grassy open areas. Geese wastes are a well-documented source of fecal coliform bacterial contamination, which has reached alarming levels in many ponds, lakes, and reservoirs, even those forming part of our domestic water supply. An additional problem is the damage resident geese cause to our marshes, where they feed on sprouting plants so voraciously that some once plentiful botanical species have all but disappeared. Addressing these problems inevitably requires reducing the goose population, but this is complicated, because geese are protected by federal migratory waterfowl laws.

B. BACKGROUND

1. Origins of the Goose Problem in Fairfax County

In earlier times the Canada goose was a strictly migratory bird with its nesting range in wilderness areas of Canada and its winter range well to the south of our area. Geese passed through our area twice a year on their migrations. By the late 1960's some Canada geese had begun to establish resident populations in this region. This is thought to have begun with birds that were propagated to stock local hunting preserves. Since that time local Canada goose populations have undergone a dramatic upsurgence. This increase now includes numerous populations of geese that have become permanent residents in the mid-Atlantic region rather than migrating. These permanent populations have become quite obvious in many parts of Fairfax County. Wildlife biologists estimate that the Canada goose population is increasing at about 15 percent annually, which indicates that problems associated with resident goose populations soon will increase to critical levels unless remedial actions are undertaken.

2. Environmental Impact of Geese

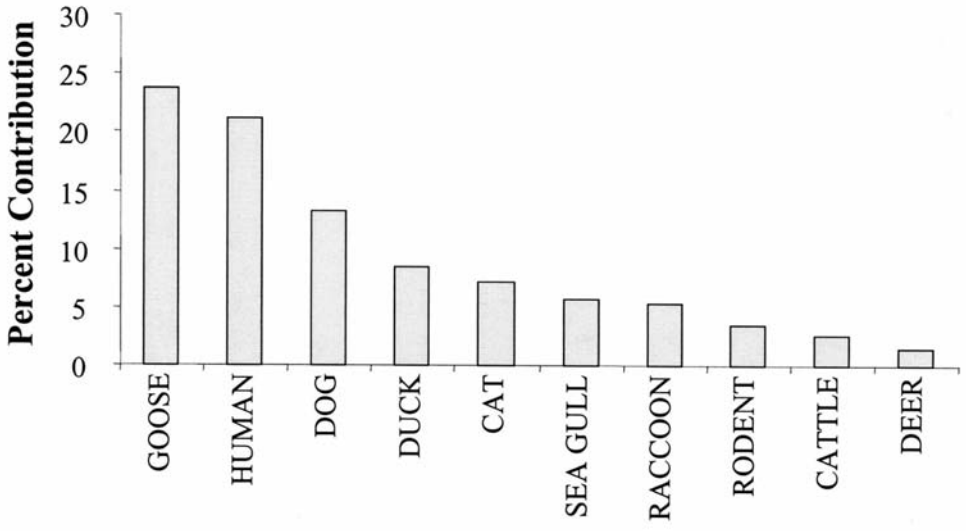
A primary impact of geese is environmental pollution, particularly pollution of streams, ponds and lakes with fecal coliform bacteria from their wastes. The magnitude of the problem is illustrated in two examples below.

Several years ago when the Evans Farm property in McLean was in the process of being

rezoned for residential development, the farm pond, which was a prominent feature of the site, was extensively sampled to determine if it contained significant levels of pollution. It was known that a resident population of Canada geese was a major contributor to any pollution of the pond. Depending on where the water samples were taken in the pond, the levels of fecal coliform bacteria were found to be from 21 to 27 times those allowable in surface waters in the Commonwealth of Virginia. Drainage from this pond passed through an under-the-road culvert to a much larger pond on the other side of the highway that had two families of resident geese. This pond had fecal coliform counts about three times the allowable level.

More recently an environmental pollution study was conducted to determine the total maximum daily load (TMDL) of fecal coliform contamination that should be permitted in Accotink Creek that feeds Lake Accotink. Federal Environmental Protection Agency (EPA) standards indicated that 98 percent of current levels of pollution should be eliminated, a truly draconian expectation. DNA tests to determine the sources of the extant fecal coliform pollution revealed that waterfowl (i.e., geese and ducks) accounted for 32 percent and other wildlife for about 17 percent of the total (see Figure IV-2-1). With waterfowl being federally protected species and other wildlife largely beyond our control, half of the current pollution load is effectively beyond the power of the County to eliminate in the near term.

Figure IV-2-1
Sources of Fecal Coliform Pollution in Accotink Creek



Another major impact of resident geese is significant alteration of the ecology of our marshlands. While migratory geese visited marshes on their twice-yearly trips through our

region, the stopovers were brief and were timed so plants had either not yet sprouted or had matured sufficiently that they were not destroyed by feeding activity. However, populations of resident geese are permanent voracious foragers which feed on newly sprouting plants to the point that some plant species are nearly eliminated from the habitat. This is particularly true of plants such as wild rice, which reseed themselves annually, and provide food to many animal species. When all of the sprouting plants are consumed before they can mature and produce seeds there will be no new plants the following year. For example, where wild rice was once an abundant species, many of our marshes are now nearly devoid of it. Thus, because of the ways in which geese change the ecology of marshes they have caused loss not only of key plant species but also of the animal species that are dependent on those plants.

C. ISSUES IN ADDRESSING THE PROBLEM

1. Goose Population Biology

Canada geese are large birds weighing 20-25 pounds with a life expectancy of some 20 years. Geese mate for life and remain together as pairs year-round. If one of the pair dies or is killed, the other will find a new mate. Mating season is from early February through early April with nesting season from late March through mid May. Geese begin to nest at three years of age. Eggs are laid approximately one per day until there are an average of five eggs per nest. Incubation (sitting the eggs) does not begin until all eggs have been laid. Eggs not being incubated are cool to the touch. Incubation time is 28-30 days. Normally all eggs hatch on the same day. Maturation of goslings occurs from early May to early July.

Geese prefer isolated sites near water to nest, with small islands being a favored location. Nests usually are built on the ground in the open, but occasionally are located in brushy or marshy areas if flooding is not a problem. If chased from their accustomed area or if the nesting area has too many pairs, they will find alternative sites, sometimes farther away from water, sometimes near other ponds in the vicinity, and occasionally on rooftops or other unlikely locations.

Migration is a learned process with which resident geese have not become familiar. Geese return to the general area of their birth to nest, sometimes to the exact site and at least to a nearby pond or lake. Migratory geese nest in Canada while geese nesting in our area are resident geese that were born here. Whereas migratory geese have a flight range of 2000-3000 miles, resident geese rarely venture more than 100-200 miles and then only in search of food, water, or safety. Migratory geese do not become resident unless they are injured and can no longer fly for long distances.

Molting season runs from early June to late July. Flight feathers are lost in June and the

birds are unable to fly for several weeks, but by early August new flight feathers are fully developed and all birds (except for those injured) are able to fly again. During the molting period geese need to be near water so they can escape from predators by swimming. They also need an easily accessible food supply during this time.

Natural predators of geese include foxes, raccoons, large owls, snapping turtles, and more recently, coyotes.

2. Considerations of Public Opinion

Many citizens find considerable aesthetic reward in having a few geese in areas where they can be observed and feel that the presence of such attractive wildlife creates a pleasant ambience. While this may be true, many others find the fouling of yards, open space, and water bodies to be unacceptable, especially where geese congregate in appreciable numbers. Moreover, most of the public is unaware, or at best only dimly aware, of the extent to which geese are major polluters of our ponds, lakes and reservoirs, including some of our water supply sources. As the general public becomes better informed about the pollution aspects of goose populations, greater consensus on remedial approaches should result.

3. Federal Limitations on Remedial Action

Geese, as migratory waterfowl, are protected by federal laws administered by the U.S. Fish and Wildlife Service. Therefore, population reduction by lethal means such as hunting is not an option. In situations where adult birds are creating an extreme nuisance the Department of Agriculture Wildlife Service can send staff to round up and relocate them. However, the Fish and Wildlife Service does issue permits for egg addling (including egg oiling) programs as a means of population stabilization. Fairfax County holds such a permit for programs anywhere in the County under supervision and/or monitoring by the County Wildlife Biologist. Use of trained Border Collies to harass geese into leaving an area is not regulated so long as they do not directly attack or kill the geese.

D. METHODS FOR POPULATION MANAGEMENT

Population management methods that utilize immediate population reduction are not an option due to stringent federal regulations against killing geese once they are hatched. However, the methods outlined below are permissible and accepted approaches to controlling goose populations. Population stabilization coupled with measures that discourage geese from future nesting in an area has proved effective in longer term reductions of population.

1. Population Stabilization

Egg addling and egg oiling are quite effective in preventing eggs from hatching. Strictly speaking, egg addling is vigorous shaking of the egg at a fairly early stage in order to homogenize the contents. This will prevent further development of the egg. Egg oiling coats the surface of the shell with a vegetable oil such as corn oil, which will prevent oxygen from getting to the interior of the egg. This also is effective in halting further development of the egg. Sometimes both methods are referred to as "egg addling". When a clutch of eggs is thus treated the goose will continue to attempt to incubate them for the normal period, but they will fail to hatch, thus limiting the population to the adult geese already present.

2. Population Exclusion

Trained Border Collies have been successfully employed to herd geese away from areas where they constitute a nuisance. The geese soon learn to avoid areas patrolled by the dogs, regarding them as unsafe, and they move to other areas where they do not feel threatened. This method of control has been particularly effective in large, relatively open areas such as golf courses. The major negative aspect of this method is the impact on adjacent properties. When the dogs herd the geese off of one property, they necessarily go to the one next door or in the near vicinity. Thus, while one locale is benefited, adjacent locales are afflicted through transference of the problem.

3. Special Foraging Areas

In some cases, an area can be set aside where a small population of geese can be resident without creating an undue nuisance. However, in such cases the aesthetic appeal of having the geese nearby must be balanced by adequate consideration of the water pollution and other waste problems created.

4. Landscaping Modifications

Altering landscaping can sometimes be an effective tool in discouraging geese from congregating near ponds. Bushy plantings, reeds and tall grasses, strategically placed around a pond, will be perceived by geese as a hiding place for predators, thus discouraging them from using that area.

5. Repellents

There are commercially available, nontoxic chemical repellents that discourage geese from eating grass. The disadvantage to this approach is the necessity for frequent reapplications, since each time the grass is mowed most of the repellent is removed along with the clippings.

6. Prohibition of Feeding

Feeding geese encourages them to become resident and to congregate in areas where a "free lunch" is provided. This exacerbates the very nuisance that one is attempting reduce. Also, feeding bread and various kitchen scraps is harmful to the geese's health even though they will avidly feed on such items.

7. Combined Approaches

Clearly, combinations of several of the above approaches can be far more effective than their use individually. For example, the use of trained Border Collies together with landscaping modifications can be quite effective in creating an "undesirable" habitat. If egg oiling is added to this for the few nests that may be established, significant reductions in usage of this area in following years can be achieved.

E. PUBLIC EDUCATION PROGRAM NEEDS

Public awareness of both the pollution problems caused by geese and of the mating and nesting cycle of geese is the key to being able to effectively address the "goose problem". At present, insufficient attention has been given by the public media to the pollution aspects of the problem. Since this pollution creates significant public health risks, the problem needs coverage on the County website and through informative bulletins to local homeowners associations.

F. PUBLIC AGENCY RESPONSIBILITY

The office of the County Wildlife Biologist within the Division of Animal Control of the Fairfax County Police Department has been assigned primary responsibility for management of geese by the Board of Supervisors. However, due to the fact that Canada geese are federally protected waterfowl, the U.S. Fish and Wildlife Service exercises significant regulatory and permitting functions that govern Fairfax County's geese management activities. Fairfax County was the first local jurisdiction in the nation to be granted a master permit for egg addling programs and is thereby authorized to train citizens, as individuals or groups, to conduct egg addling under its monitoring and control. Except for federally issued hunting permits, intentional killing of hatched geese by humans is prohibited by federal law. In cases where it is necessary for adult geese or hatchlings to be removed from an area, this activity is conducted by the staff of the U.S. Department of Agriculture - Wildlife Services under permit from the U.S. Fish and Wildlife Service.

The population stabilization (egg oiling) program is highly cost effective since, once trained,

all labor intensive activities are performed by local citizen volunteers. The only staff activities required are training, monitoring and reporting under the terms of the federal permit.

G. PROGRAM IMPLEMENTATION ACTIVITIES

Goose management programs have been implemented at a number of locations in Fairfax County. Among the locations and the measures implemented under the Fairfax County permit and monitoring are:

1. Annandale
   a. Northern Virginia Community College - population stabilization and nuisance abatement, 3 years.
   b. Pinecrest Community - population stabilization and nuisance abatement, 2 years.
   c. Pinecrest Golf Course - population stabilization and nuisance abatement, 2 years.

2. Centerville
   a. Franklin Farms - population stabilization, 3 years.
   b. Westfields - population stabilization, 2 years.

3. Fairfax County
   a. Lake Barcroft - population stabilization and nuisance abatement, 4 years.
   b. Fairfax County Parks - population stabilization, 4 years.
   c. Copeland Pond - population stabilization and nuisance abatement, 3 years.
   d. Brook Hills - population stabilization and nuisance abatement, 3 years.
   e. Waters Edge - population stabilization and nuisance abatement, 2 years.

4. Oakton
   a. Fox Lake - population stabilization, 2 years.

5. Reston
   a. Reston Community - population stabilization, 3, years.

6. Vienna
   a. Trinity School - population stabilization, 3 years.
   b. Champion Lake - population stabilization, 2 years

All of these programs have demonstrated reasonable degrees of success in stabilizing populations. In some cases, populations have actually declined over time due to discouraging

geese from further attempts to nest there.

H. CONCLUSIONS

While geese in small numbers are regarded by many as a pleasant addition to the local ambience, large resident goose populations in many areas of the County constitute a major environmental nuisance and public health risk. Resident goose populations tend to congregate near ponds, lakes, and slow-flowing streams, which leads to contamination of these water bodies with high levels of fecal coliform bacteria. In addition they foul the grassy open areas in the vicinity with their feces. The high growth rate of the resident goose population and the limitations on methods of control have raised this pollution to levels that are not only environmentally unacceptable but that now constitute a significant public health problem.

While there are already good programs in place to address these problems, they need to be replicated more widely in additional areas of the County. Moreover, more intensive public information campaigns and community outreach efforts are badly needed to actively involve a larger number of individuals and community organizations in population control programs.

I. RECOMMENDATIONS

1. EQAC finds the current programs are effective and should be continued.

2. EQAC feels that the current programs need to be replicated in many other areas of the County by training additional citizens and homeowner groups in goose population stabilization methodology.

3. EQAC recommends enhanced public education outreach to sensitize all Fairfax County residents and owners of nonresidential properties to the pollution problems caused by geese and the programs available for addressing them.

4. EQAC recommends enhanced public education outreach to acquaint all Fairfax County residents with the destructive role excessive goose populations play in our marshland habitats.

USEFUL REFERENCES

The organization GeesePeace in America has an excellent and informative website that covers many aspects of the goose problem and methods of addressing them. It can be accessed at http://www.geesepeace.org

IV-3. WILDLIFE BORNE DISEASES OF CONCERN IN FAIRFAX COUNTY

A. OVERVIEW

There are a number of zoonotic diseases (those in which wildlife serves as a reservoir) that affect humans. Four such diseases of greatest concern in Fairfax County are West Nile Virus, Lyme Disease, Rabies, and the complex of diseases caused by fecal coliform bacteria. The causative agents, modes of transmission, and means of prevention are briefly discussed below.

B. BACKGROUND

1. West Nile Virus

West Nile is a flavivirus that is transmitted to humans and other warm-blooded animals by mosquitoes that have fed on birds that are infected with the virus. Crows have been particularly implicated as a reservoir species, but it is now known that many other bird species are also involved. Mosquitoes are intermediate carriers that convey the virus from birds to humans. The principal intermediate carrier is *Culex pipiens*, the common house mosquito. There is currently no evidence for person-to-person transmission (except in the unusual situation of organ transplants or blood transfusions from infected donors). Some people infected with West Nile virus experience no symptoms. Others have mild flu-like symptoms such as low-grade fever, head and body aches, skin rash or swollen lymph nodes. In a few cases such as the elderly, children, and those with weakened immune systems, the infection may cause encephalitis (inflamation of the brain) or, rarely, death. Encephalitis symptoms include rapid onset of high fever, severe headache, stiff neck, muscle weakness, and coma. The virus is of recent occurrence in this country, having been first identified in New York only three years ago. The Centers for Disease Control and Prevention (CDC) of the U.S. Public Health Service have confirmed 161 cases including 18 deaths since 1999. However, since most of those infected have mild symptoms that do not require a visit to the doctor, these reported cases no doubt represent only a fraction of actual infections.

a. Preventive Measures

i. Mosquito Habitat Elimination

An important preventive measure to reduce the chance of infection with West Nile virus is to eliminate, wherever possible, standing water that provides a breeding

habitat for mosquitoes. Any containers such as cans, pails, wheelbarrows, etc., should be emptied and stored in such fashion that water will not collect in them. Bird baths and similar containers should have the water changed every two or three days. Ponds can be stocked with the small fish *Gambusia* that feed on mosquito larvae. There are two species *Gambusia affinis* and *G. holbrooki*. Both are highly effective in keeping ponds and lakes free of mosquito larvae. *Gambusia affinis*, the most common species, has become endemic in many areas of Eastern Virginia and is readily transplanted from one pond to another.

ii. Insect Repellents

Since it is nearly impossible to completely eliminate the presence of mosquitoes, some of the most effective preventive measures available for mosquito-borne infections such as West Nile virus and tick-borne Lyme disease are sprays or lotions containing DEET (N,N-diethyl-meta-toluamide). The active ingredient, DEET, was developed by the U.S. Department of Agriculture in 1946, originally for use by the military. The most convenient method of application to the exposed skin is as an aerosol spray. A recent study reported in the *New England Journal of Medicine* showed that the higher the concentration of DEET in the spray, the longer lasting the protection. In the case of mosquitoes, products containing 20% DEET were effective for four hours, those with 25% DEET were effective for five hours, and those with 35% DEET were effective overnight. It is estimated that there have been more than eight billion applications of DEET over the past 50 years with an excellent safety record. However, a study of DEET by pharmacologists at Duke University, reported in the November 2001 issue of the *Journal of Experimental Neurology*, indicated that frequent and prolonged DEET exposure might cause adverse neurological effects. It was recommended that use be limited to preparations containing no more than 30% DEET for adults and lower concentrations for children.

2. Lyme Disease

Lyme disease, caused by the bacterial spirochete *Borrelia burgdorferi*, is transmitted to humans primarily, if not exclusively, by *Ixodes scapularis* the common deer tick. Deer ticks are dark brown to black and about the size and shape of a sesame seed. The white-tailed deer appears to be the primary reservoir, but rodents have also been implicated. Lyme disease was first identified in Lyme, Connecticut, in the mid-1970s when a group of children developed arthritis-like symptoms. Within a few days to several weeks of receiving an infected tick bite most victims will have a red, slowly expanding "bull's-eye" rash (red in the center, pink at the periphery) and such symptoms as malaise, fever, headache, muscle and joint aches. The longer a case of Lyme disease persists without treatment, the more severe, debilitating and long lasting the symptoms are likely to be, such as arthritis and neurologic abnormalities. Many of the physicians treating Lyme disease have found three or four week courses of doxycycline or amoxicillin to be

effective treatments for early stages of the disease, but later stages may require intravenous antibiotics for a month or more.

Confirmed cases of Lyme Disease underwent a sharp increase through June 1997 (Table IV-3-1). The decrease of the next two years may be attributable to greater public awareness of the threat represented by deer ticks and greater use of proper preventive measures when hiking and working in wooded areas. It is unclear, however, whether a decrease in deer population will lead to a corresponding decrease in Lyme Disease cases, since other animals can act as reservoir species and may inhabit areas within which deer populations decline. However, it is interesting to note that neighboring, semi-rural Loudoun County, which has a large deer population, has the highest per capita incidence of Lyme disease cases reported in the Commonwealth. In 2001 there were 65 cases compared with 29 cases in 1999 according to the Loudoun County Health Department. This suggests a strong upward trend in incidence where there are large populations of white-tailed deer.

Table IV-3-1
Reported Lyme Disease Cases Meeting Centers for Disease Control (CDC) Case Definition Program

Fairfax County

Period Covered	Reported Cases	Contracted outside of Fairfax County
July 1994-June 1995	14	N.A.
July 1995-June 1996	22	N.A.
July 1996-June 1997	31	N.A.
July 1997-June 1998	16	8
July 1998-June1999	13	9
July 1999-June 2000	50	8
July 2000-June 2001	51	9
July 2001-June 2002	61	33

(Source: Fairfax County Department of Health)

a. Preventive Measures

i. Vaccine

In our annual Report for 1999 we noted that a new vaccine (Lymrix) for the prevention of Lyme disease had just been released. In our Annual Report for 2000, we noted that there had been adverse reactions to the vaccine and advised consultation with your personal physician about the advisability of being vaccinated. As a result of an increasing number of adverse reactions, this vaccine has now been withdrawn from the market. While it is true that vaccination of those persons intensively exposed to deer ticks might have been helpful, for the vast majority of the population consistent use of ordinary preventive measures should be entirely adequate. When engaged in activities that might result in exposure to deer ticks, proper clothing is a must, preferably long pants tucked into boot tops or lower legs, trouser bottoms and sock tops sprayed with insect repellent, since most ticks are encountered close to the ground.

ii. Insect repellent

The same DEET-containing repellents recommended for mosquitoes (see West Nile Virus above) are also highly effective for ticks. See the discussion of DEET-containing insect repellents in the West Nile virus section above.

3. Rabies

Rabies is a viral disease that affects the nervous system and may have a latent period from a number of days to several weeks. During the latent period, between the time of an animal bite and the onset of overt symptoms, the virus is propagated along the nerve fiber sheaths until it reaches critical areas of the brain. While rabies has been present in this area for many years, it exists at a low level with the incidence appearing to cycle over a period of several years. This is attributed to the fact that infection, when it reaches the symptomatic stage, is uniformly fatal. Thus, an infected animal may infect several others and there will appear to be a relatively high incidence, but when those animals die there are fewer carriers for a period of time when the incidence appears to be lower. Rabies is transmitted to humans and other mammals through the saliva of an infected animal almost always in the overtly symptomatic stage which usually only lasts about ten days. During this time an infected animal usually exhibits aberrant behavior, such as a nocturnal animal being around during the day, exhibiting signs of confusion, showing an unsteady gait, desperately seeking water but unable to drink, often aggressively approaching dogs and humans, etc. The main wildlife reservoirs in this area are raccoons, foxes, and to a lesser extent some bats. Domestic animals, e.g., dogs and occasionally cats, may act as secondary transmitters of the disease after having contracted it from a wildlife source.

a. Preventive measures

The most important measure for prevention of rabies is to avoid being bitten by or direct contact with an animal that might be infected. If you encounter an animal that is behaving strangely or exhibiting symptoms such as excessive drooling, contact Fairfax County Animal Control at 703-830-3310 without delay. This also applies if you find a dead animal that you suspect may have died of rabies. Animal Control will send a professionally trained officer to impound the animal for quarantine and testing. If you are bitten or scratched or come in contact with the animal's saliva, seek immediate medical attention so a determination can be made as to whether you may require a course of preventive inoculations. The protective serum used for such inoculations has been substantially improved in recent years so that fewer doses are required and those have fewer unpleasant side effects.

4. Fecal Coliform Bacterial Diseases

Fecal coliform bacterial diseases in humans are caused primarily through ingesting or wading or swimming in contaminated water. There are a number of bacteria that can be responsible, but the thing they share in common is being present in the gut and intestinal wastes of a variety of wildlife and domestic animals. The relatively new science of molecular genetic DNA testing has made it possible to reliably identify the particular animals responsible for the pollution of a given water sample. Studies carried out at several sites in Fairfax County indicate that Canada geese living in and about ponds and streams are principal contributors, while ducks, deer, raccoons, and foxes and domestic dogs and cats are also significant sources (see Table IV-2-1 on page IV-26). When the wastes from these animal sources are deposited directly into, or washed into, streams and ponds the pollution can build up to hazardous levels. For example, one pond in the McLean area, inhabited by Canada geese that had become resident, was extensively tested several years ago and was found to have levels of fecal coliform bacterial contamination that ranged from 21 to 27 times that allowable in surface waters in the Commonwealth of Virginia. Another occasional source of such contamination is from leaks, overflows or ruptures in the public sanitary sewer system or private septic systems. While illness from such bacteria is usually not life threatening and is readily treated with antibiotics, exposure to waters that one has reason to believe may be polluted should be scrupulously avoided.

Recently, in an attempt to reach budgetary goals, the Health Department suggested the possibility of eliminating the Stream Monitoring Program. EQAC intervened in the discussion, pointing out that this monitoring was environmentally critical and not duplicated in any other County programs. As a result, the Board of Supervisors directed that the Stream Monitoring program be continued at present levels.

a. Preventive measures

There is a general solution to this problem in which pollution of our surface waters is prevented in the first place. The main individual solution to the problem is to avoid

disease caused by fecal coliform bacteria by not drinking water from sources whose pollution status is unknown and by not wading or swimming in water that is known to be, or suspected of being, polluted.

C. PUBLIC EDUCATION PROGRAM NEEDS

The Fairfax County Department of Health has available an excellent booklet entitled *Preventing Tick-borne Diseases in Virginia*. They also have a brochure entitled *Rabies and Animal Bites: What you should know and what you should do*. Additional information is available through the Health Department section of the County website www.co.fairfax.va.us.

With the recent nearly epidemic explosion of West Nile Virus, there is a very high probability of it becoming endemic in our area for the long term. Public education materials, comparable to those noted above, are available from our own County Health Department. In addition, the Centers for Disease Control and Prevention of the U.S. Public Health Service has some recently developed materials that are quite good.

Because of the frequently changing levels of pollution in our surface waters, it is not practical to create printed materials identifying those streams and ponds that are affected by fecal coliform bacterial pollution. However, our excellent County website is an ideal way for the Health Department to post frequent updates on results of the Stream Monitoring Program and notices about waters that should be avoided due to pollution.

The public media generally do a fairly good job of reporting the finding of rabid animals. Such incidents could also be posted on the County website as advisories.

D. PUBLIC AGENCY RESPONSIBILITIES

The primary public agency responsibilities lie in the following areas:

1. Public education
2. Monitoring of disease incidence
3. Monitoring of pollution and exposure hazards
4. Providing animal control
5. Providing mosquito abatement, where needed

The Animal Control Division of the Fairfax County Police Department is responsible for animal control activities such as impounding animals suspected of being rabid and similar wildlife-related activities. The Health Department has responsibility for most prevention and public education activities and also the various monitoring and information gathering programs.

E. CONCLUSIONS

The upsurgence of West Nile Virus and Lyme Disease require continual monitoring and public education and are rapidly becoming serious public health issues. Rabies is a continuing low level, more or less steady state, problem. Waters polluted by excessive levels of fecal coliform bacteria require mitigation, where possible, and monitoring and posting to warn the public against exposure. Malaria, which began looming as a significant problem as this report was about to go to press, will require careful monitoring and epidemiologic tracking as well as mosquito abatement.

F. RECOMMENDATIONS

The recommendations provided below address only the third section of this chapter (Wildlife Borne Diseases of Concern in Fairfax County). Recommendations addressing deer management and geese issues are found beginning on pages IV-21 and IV-32, respectively.

1. The Health Department should continue the Stream Monitoring Program and post advisories on currently polluted waters.

2. The Health Department should continue and enhance its excellent public education programs.

3. The Police Department should continue its animal control program and, in conjunction with the Health Department, expand public education initiatives in key areas, such as control of rabies and of wildlife contributing to pollution of surface waters.

4. The potential need for County-wide mosquito abatement programs as a means of suppressing West Nile Virus and malaria should be vigorously evaluated.

LIST OF REFERENCES

Fairfax County Department of Health. Preventing Tick-borne Diseases in Virginia.

Fairfax County Department of Health. Rabies and Animal Bites: What you should know and what you should do.

ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER V

SOLID WASTE

V. SOLID WASTE

A. ISSUES AND OVERVIEW

The solid waste system for Fairfax County operated well during FY 2002. The County met its contractual obligations to the COVANTA Energy/Resource Recovery Facility (E/RRF), and all other in-place programs of collection and recycling operated without significant change. The County instituted capacity backup measures to ensure that the County will have capacity in the event that a business or any other issue occurs with the E/RRF such as described below.

There are two solid waste divisions within the County government: the Division of Solid Waste Collection and Recycling; and the Division of Solid Waste Disposal and Resource Recovery. These two Divisions form a single Line-of-Business, under a High Performance Organizational (HPO) philosophy. The two groups meet weekly to discuss issues of mutual concern.

1. Contractual Issues and Landfill Capacity Backup

One area of interest was that on April 1, 2002, COVANTA Energy Inc. (COVANTA) declared Chapter 11 bankruptcy. This included the Fairfax Energy/Resource Recovery Facility (E/RRF), the main disposal location of municipal solid waste for Fairfax County. County staff had been following a decline in the parent company's stock price before the bankruptcy declaration, and met several times with the company's senior management staff to discuss the implications to the County.

The County also sought to formalize agreements with local landfills after the events of September 11, 2001, along with the Anthrax contamination concerns, due to the threat of the E/RRF being impacted from such actions. The County issued an invitation to bid backup disposal capacity to existing landfills, and received a response from three vendors with four landfills. In late 2001, Fairfax County signed contracts with all three vendors for emergency/backup waste disposal capacity for Fairfax County. These facilities, combined with the existing Prince William County Agreement, would provide sufficient daily capacity for waste disposal for Fairfax County in the event the E/RRF was unable to process waste. The County utilized these alternate disposal locations during FY 2002 when maintenance was performed on the E/RRF.

2. Disposal Fee

The disposal fee, which residents and commercial hauling companies pay remained at $45 per ton for FY 2002, and will also remain the same in FY 2003. This fee has remained the same since 1996.
In early FY 1999, the County began to offer a discount on the system fee, from $45 per ton

to $36, in exchange for waste delivery commitments from haulers. Larger haulers (those delivering over 5,000 tons per year) were offered contracts with guaranteed delivery commitments based on the prior years' tonnage. Hauling companies that collect less than 5,000 tons per year were offered contracts through which they promised to deliver all of their waste collected in the County to the E/RRF or the I-66 Transfer Station. Most of the waste disposal companies operating in Fairfax County have entered into these contracts.

The discount contract rate for FY 2002 was $37.95 per ton and the rate in FY 2003 is $39.95 per ton. The County has been able to maintain participation from local hauling companies at this rate.

While it appears that the County is netting more revenue with the $2 per ton increase, it actually is not. The associated waste disposal fee at the COVANTA E/RRF also rose by $2 per ton for FY 2003, hence the increased contract fee simply offsets the increased E/RRF fee costs. The E/RRF's fee increased due to the equipment added for the Clean Air Act retrofits. These modifications make the exhaust from the facility one of the cleanest processes of electrical energy production; they also increase operating and maintenance costs.

The discounted disposal price has put pressure on the overall County solid waste system. The system fee contains the disposal fee paid to COVANTA, plus the additional cost of operating the County's solid waste public benefit program activities such as recycling education, household hazardous waste operations, maintenance of the closed I-66 Landfill, the Transfer Station, ordinance enforcement and the administrative functions of the program.

The difference between the discounted disposal price, which the County charges to haulers ($39.95 per ton in FY 2003), and the disposal price paid to COVANTA (anticipated at $30.00 per ton for FY 2003) yields a differential of $9.95 per ton. The difference is not sufficient to cover all solid waste system costs. This situation has gotten somewhat better, as in FY 2001 the difference was only $5 per ton. The difference needed to fund the solid waste public benefit programs has been bridged by contributions from the General Fund. No detrimental program cuts were necessary, as sufficient funding was available. Staff will continue to monitor the situation closely and will be making recommendations as part of the Solid Waste Management Plan discussed earlier.

Staff has also continued working with the County Attorney and senior management regarding the Lorton land transfer issues relating to Fairfax County assuming control of the Lorton Reservation, as the landfill and E/RRF are part of that property.

B. PROGRAMS, PROJECTS, AND ANALYSIS

1. Waste Disposal

a. Solid Waste -- I-95 Sanitary Landfill

i. Groundwater Monitoring

Groundwater samples continue to be collected twice per year for analyses, typically in March and September. Results from the September, 2001 groundwater monitoring event exceeded the Groundwater Protection Standards (GPS) established for the facility in several wells, and, pursuant to the landfill's permit, the Virginia Department of Environmental Quality (DEQ) was notified. These wells, located very close to the actual buried waste, were anticipated to trigger the notification requirement. Exceeding the GPS limits requires that the County perform an Assessment of Corrective Measures (ACM) to measure the impact of the groundwater to potential receptors, measure the delineation of contamination, and hold a public meeting to discuss the remedy to the problem. The County became aware of the exceedance in February 2002, and, by regulation, was obligated to send the ACM report to DEQ by August 14, 2002. The County has been very active in delineating the nature and extent of the contamination detected, and recently drilled eleven additional groundwater monitoring locations and has sampled them twice for contaminant investigation. The results are still being analyzed by hydrogeological professionals hired by the County. Initial reports indicate the contaminants of concern are located near the actual waste depository, and have not migrated away from the facility. Additionally, no persons are drinking the groundwater downstream, consistent with the Risk Assessment prepared for the facility several years ago.

The engineering controls at the landfill have been instrumental in maintaining good environmental control at the facility. Actions such as landfill closure and landfill gas extraction have worked to reduce groundwater impacts.

The groundwater monitoring program will continue to follow the assessment monitoring requirements of the State, where 216 chemicals are monitored. The County will continue to monitor groundwater and identify potential impacts of landfill operations outside the boundaries of the landfill site.

ii. Landfill Gas Systems

The I-95 Landfill also has the largest landfill gas collection system of any facility in the State of Virginia, with over 250 extraction wells. The landfill gas is distributed to a variety of utilization devices, including five enclosed flares and two power plants operated by Michigan Cogeneration Systems (MCS), generating over 6.1 MW of electricity.

A pipeline, installed by the County and MCS between the I-95 Landfill and the Noman M. Cole, Jr. Pollution Control Plant (NCPCP), continues to convey landfill gas to NCPCP for a biomass incineration facility. This pipeline is over three miles in length and continues to result in significant savings in energy cost at the NCPCP, estimated in 2002 at nearly $1 million for the year.

The establishment of the gas control systems, significantly ahead of state and federal requirements, has not only provided the landfill with outside revenue sources, but has significantly contributed to an improvement in air quality in the County.

The County's consultant, Malcolm Pirnie, had previously estimated non-methane organic compound (NMOC) emissions utilizing EPA-approved Tier 2 sampling methodology for the I-95 Landfill. The results confirmed that the NMOC emission rate at the I-95 Landfill does not exceed 50 megagrams per year. The results are based upon actual field tests of the landfill gas at various sources at the landfill. Based upon this testing, the County determined that the facility was not a major source; therefore, it would be exempt from having to undergo the routine surface monitoring and annual report submittal. However, DEQ established the threshold at 23 megagrams for the Northern Virginia area, and the I-95 Facility will now comply with quarterly surface monitoring and reporting requirements of the rule. Additionally, in July, 2002, the I-95 Landfill submitted a Title V Air Application to the Virginia DEQ to comply with air regulations.

Nearly 20 additional landfill gas wells were drilled during the past year at the landfill. Nearly 15 of these wells were installed to replace old wells that collapsed during the settlement process of the landfill. As the landfill settles, it does not do so uniformly, pinching the open wells in the process. County staff maintains the wells at the site.

iii. Energy/Resource Recovery Facility

As previously stated, the Energy/Resource Recovery Facility (E/RRF) operated by COVANTA Fairfax, and its parent company COVANTA Energy, Inc. declared bankruptcy on April 1, 2002. Daily operations at the plant have been unaffected, and business occurs nearly normally, as the company works through the

bankruptcy process.

The new continuous emissions monitoring devices were also installed. These devices replaced the older equipment originally installed at the E/RRF, and will monitor opacity, SO_2, temperature, O_2, and CO .

The facility also installed an ash conditioning system to reduce dust from the ash product and to enhance the metal recovery from the ash product.

Together, the capital improvement cost for these Clean Air Act improvements totaled nearly $7.75 million. The operating costs of these devices will also add approximately $1 per ton to the processing costs of the facility.

The I-95 Energy Resource Recovery Facility monitors all emissions from the facility on an annual basis. This information is sent to the Virginia Department of Environmental Quality. The facility did report a problem to DEQ in August, 2001 where the continuous emissions monitoring equipment was not calibrated correctly. COVANTA feels that the equipment was operating within tolerances; however, because the equipment was not calibrated per specifications, it is considered un-validated data.

The Guaranteed Annual Tonnage (GAT) requirement for the E/RRF is 930,750 tons per year and remains fixed for the length of the contract between the County and COVANTA. The contract will end in February, 2011 unless modified prior to that date. The amount of waste delivered to the facility in FY 2002 was approximately 1,030,000 tons. The E/RRF discontinued processing wastewater treatment plant sludge from the District in FY 2001 and only processed a minimal amount in FY 2003 from the NCPCP. Sludge processing was discontinued as volumes of solid waste have increased, displacing the need for that waste stream. The amount of waste accepted at the E/RRF exceeded the GAT, and County staff also shipped nearly 60,000 tons of solid waste to other landfills when the capacity (or availability) of the E/RRF could not accommodate waste generation. Staff has worked to maintain the E/RRF at full capacity, therefore maximizing energy production and increasing revenues. The following efforts have been undertaken to continue to meet or exceed the tonnage commitment:

- The waste agreement with Prince William County has been renewed;
- The supplemental waste program has been continued, and the County is working with COVANTA to attract additional waste;
- The County has continued an agreement with the District of Columbia's solid waste contractor to continue deliveries to the E/RRF (at higher prices);
- The County has entered into contracts with haulers to deliver all waste

collected in the County in exchange for a reduced disposal price; and
- The County has continued the spot market program, to attract out-of-County waste to the facility.

iv. I-66 Transfer Station, Landfill, and Citizens Recycling and Disposal Facility

The Transfer Station was inspected by DEQ several times during 2002 for compliance, and no deficiencies were noted on any inspection.

Staff worked to bring an outside contractor on board to assist with transport of waste to the various disposal locations. The outside contractor serves to add trucks when peak demand requires waste transport, while the County fleet maintains a stable base. The County fleet is somewhat cheaper than the outside contractor, however the peaking flexibility is advantageous to the County and serves to lower overall costs.

Additionally, the County has leased seven tractor units instead of purchasing them outright. This is another experiment to reduce overall operating expenses.

Groundwater monitoring continues around the site. No anomalies were noted in the sampling program during the year.

v. Household Hazardous Waste Program

The County continues to operate two household hazardous waste collection centers; one at the I-66 Transfer Station and the other at the I-95 Landfill, each is open 3-days each week. However, disposal of waste oil, antifreeze, and batteries is available 7-days a week at both sites. This program, as well as the Conditionally Exempt Small Quantity Generator (CESQG) program, are discussed in more detail in the Hazardous Materials chapter of this report.

vi. Ordinance Enforcement

Solid Waste Program staff continue to respond to ordinance complaints related to solid waste issues. In FY 2002, complaints continued to rise slightly, with complaints regarding illegally parked vehicles dropping.

2. Waste Reduction/Recycling Programs

The Fairfax County Division of Solid Waste Collection and Recycling (DSWCR) is

responsible for the management and implementation of the Countywide recycling program to ensure compliance with Chapter 109 of the *Fairfax County Code* and State law and associated regulations. The Virginia Department of Environmental Quality (DEQ) is responsible for administering regulations that require all municipalities in the Commonwealth to recycle at least 25 percent of the total volume (by weight) of municipal solid waste (MSW) generated in the jurisdiction. These regulations are codified as 9 VAC 20-130-10 and became effective on August 1, 2001. Annual reports documenting the recycling rate for the preceding calendar year are now due to the DEQ by April 30 each year.

To comply with the requirement to measure and track the recycling rate, Fairfax County has developed and currently administers Chapter 109 of the *County Code*, which provides the requirements for solid waste collection, recycling and disposal for residences and commercial properties located within Fairfax County.

The County requires annual reports on the tonnages of recyclables collected by individual solid waste haulers permitted within the County, commercial businesses that generate regulated quantities of MSW, and the Material Recovery Facilities (MRFs) and other recycling entities operating in Fairfax County. These reports are due to DSWCR by the end of February of each year. These reports are evaluated and compiled to calculate the Countywide recycling rate, which for calendar year 2001 was 34% (calculated as 34.2%).

The recycling rate of 34% is reduced from the rate calculated for calendar year 2000, which was reported as 36% (calculated as 35.6%). The reasons for this are twofold: first, the methodology for calculating the rate was changed by the recently-promulgated rules as compared to that used for the previous year; and secondly, the MSW generation rate increased slightly, cumulatively causing a reduction in the rate of 1.4%. In reality, the tonnage of recyclables collected in Fairfax County in calendar year 2001 is approximately 4,000 tons less than calendar year 2000 (410,360 tons versus 405,540 tons, respectively). As demonstrated by these calculations, Fairfax County exceeds the recycling requirement of 25% of the overall tonnage of MSW generated in the County.

Figure V-1 below depicts the historical rates of recyclables generation in the County since the recycling program's inception in 1988. As documented in the bar chart, recycling rates in the County have grown steadily over the years, with only minor decreases, indicating a strong trend toward community compliance with the recycling requirements.

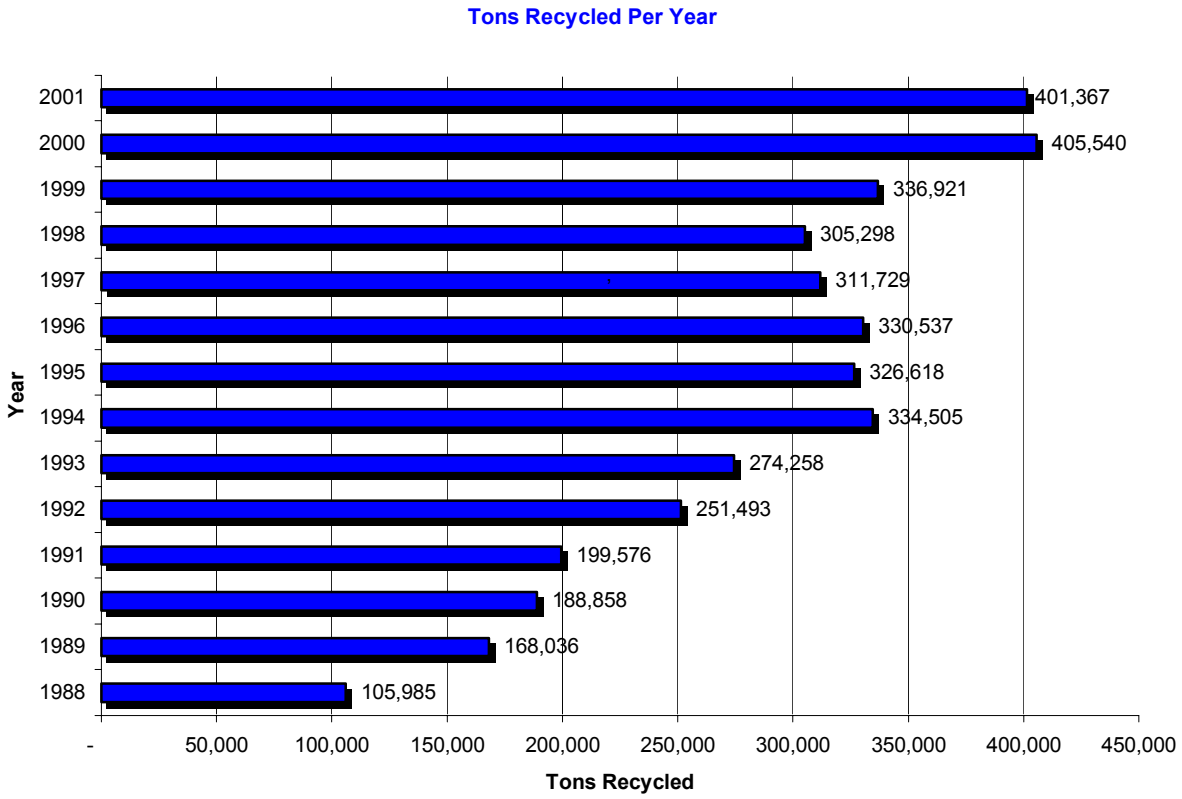


Figure V-1. Tons recycled since the inception of Fairfax County's recycling program in 1988. (Source: Fairfax County Department of Public Works and Environmental Services)

In addition to Countywide program management, the DSWCR is responsible for the:

- Collection of refuse and recyclables from about 40,000 residences primarily on the east side of the County;
- Collection of refuse and recyclables from the County Agency buildings;
- Vacuum leaf collection for 19,000 residences;
- Collection of refuse and recyclables from the Solid Waste Reduction and Recycling Centers (SWRCCs or Park Outs);
- The Recycling Drop Off Centers (RDOCs);
- Refuse removal due to evictions and other court orders; and

- All public outreach and education for recycling programs.

Brief descriptions and updates of programs are provided in the subsequent sections of this report.

a. Residential Programs

i. Residential Recyclables Collection

Residential recycling of several Principal Recyclable Materials (PRMs as defined by DEQ regulations) became mandatory in 1992 for all single family homes, residential townhouses, apartment complexes, condominium units, and residential duplexes with curbside collection. PRM recycling became mandatory in 1993 for residential units and building complexes with dumpster service. The recycling of a variety of PRMs is known as multimaterial residential recycling. Currently, DSWCR requires curbside recycling of glass food containers, newspapers, and aluminum and steel cans only from residential areas. However, in 2000, the residences served by County collection were provided with an additional recycling opportunity by adding cardboard and mixed paper.

Weekly curbside collection of newspaper, glass containers and metal food and beverage cans is required to be conducted at all residences served by curbside collection provided by DSWCR or by the other private haulers permitted to operate in the County. Additional voluntary collection of plastics and cardboard may be offered by private haulers. For multifamily dwellings such as apartment buildings that maintain central collection areas in the complex, pick up of recyclables is not required on a weekly basis due to the logistical impacts of the arrangements of these types of dwellings.

In order to ensure that new multifamily dwellings are designed (prior to construction) to provide adequate common areas for the installation and operation of recycling equipment, amendments were made to the *Fairfax County Public Facilities Manual* that became effective for new Site Plans submitted after September 1, 1993. A Recycling System Statement on the Site Plan cover sheet identifies properties required to recycle, so that appropriate facilities may be designed prior to building construction. These requirements do not apply to single family residential complexes that will have curbside collection of refuse and recyclables.

The DSWCR provides refuse and recyclables collection for approximately 40,000 single family homes and 1,200 public housing units. The bulk of the

County's residential units, 207,900 households, receives trash and recyclable collection from approximately 30 private haulers that must be permitted by the DSWCR's sister agency, the Division of Solid Waste Disposal and Resource Recovery (DSWDRR). For those residences not serviced by the County or private haulers, refuse and recycling collection is available once a week at the SWRCCs or Park Outs.

ii. Yard Debris

Recycling of yard debris (small branches, leaves and grass) is also required in Fairfax County. Curbside collection of yard debris is provided by the private curbside haulers, and the County in sanitary district areas.

In 1998, the County faced a shortfall in yard debris management capacity due to the closure of a yard waste management facility used by the County. A new yard waste management facility in Loudoun County alleviated this shortfall in capacity, and in FY 2002, the County sent 49,726 tons of yard debris to be composted. The majority (27,943 tons) was sent to the Prince William Compost Facility at Balls Ford Road, with a smaller amount (21,783 tons) sent to the Loudoun County Compost Facility. These tonnages may not reflect the total tonnages from Fairfax County, as hauling companies take yard debris directly to yard waste facilities. Additionally, vacuum leaves are ground and given to residents at County facilities, and are not reflected in the tons hauled to the composting facilities. An additional 45,905 tons of brush were recycled into mulch, and 9,696 tons of vacuum leaves were distributed. Estimates are made for some portions of the brush and yard waste stream, as it is not practical to weigh some materials given for distribution.

To assist in public recycling education, the County has developed literature on managing yard debris at home and has prepared a video entitled *Essentials of Composting*, which is available from libraries and DSWCR. The Yes In My Back Yard! (YIMBY) program continues, focusing on backyard composting, recycling, and mulching of grass clippings. DSWCR relies on USDA's Natural Resources Conservation Service (NRCS) to provide composting expertise and advice to residents who request such service.

iii. Drop-Off Centers

Fairfax County operates eight RDOCs, including three cooperative sites in the towns of Herndon and Vienna and in the City of Falls Church. The number of RDOCs has decreased from the fourteen available in 1995, since participation in curbside collections reduces reliance on the RDOCs. However, the RDOCs

provide additional recycling opportunities for residents since these centers are equipped with containers to collect mixed paper, cardboard and the Nos. 1 and 2 plastics bottles and jugs. These RDOCs are relied upon by small commercial operations in the County to facilitate their recycling while significantly reducing their costs for refuse disposal.

iv. Solid Waste Haulers

For areas of the County where County refuse and recyclables services have not been requested via the Sanitary District Petition process, privately-owned and operated refuse and recyclables collection firms permitted by DSWDRR collect these material curbside from residences and commercial businesses. These independent haulers do not operate within specific geographic areas but rather compete for individual homes, contracts with civic or homeowner's associations, and commercial or office contracts. As such, there can be instances within the County where several refuse/recyclables collection trucks operate on the same street on the same day. This creates the obvious issues of truck traffic and safety, roadway use, and certain operational inefficiencies with respect to duplicating collection routes. The only area within the County where this duplicative effort does not occur is within the DSWCR's collection area on the east side of the County. These routes are prescribed during the Sanitary District Petition process and are managed according to geographical requirements.

All solid waste haulers permitted in Fairfax County are required to report residential recycling tonnages annually to the County. Reports requesting this information are sent out at the end of the calendar year and are due to DSWCR by the end of February. These reports provide an accounting of the tonnages of individual recyclable commodities collected by individual haulers for use in the preparation of the recycling rate report due to DEQ annually. Private solid waste haulers typically rely on weight tickets to provide the tonnages of recyclables collected and are required to maintain documentation of recyclables collected on file in their office for review and inspection upon request of DSWCR.

3. Commercial Programs

a. Mandatory Commercial Recycling Programs

DSWCR administers a commercial recycling program that is mandatory for businesses operating in the County based on the quantity of refuse generated or the number of employees occupying the building. Those commercial properties generating 100 tons of waste annually or housing 200 office workers are required to recycle the predominant principally recycled material (PRM) in the waste stream

(typically office paper), and report the quantities recycled annually to the County.

b. Voluntary Commercial Source Reduction Programs

The County has promoted source reduction within the private sector by using case studies to publicize the efforts and cost savings realized by businesses that have set up successful source reduction programs. Technical assistance is provided to the private sector to assist them in the development of voluntary and mandatory recycling and source reduction programs. Source reduction in Fairfax County is a challenge because of the lack of manufacturing base where source reduction activities typically are concentrated. The most effective voluntary source reduction strategy that is feasible for Fairfax County is the management of grass clippings and other yard debris in home composting systems or by simply leaving them on the lawn for natural decomposition.

c. County Agencies

DSWCR requires that all County agencies serviced by County collection for refuse and recyclables participate in recycling for that particular location. In calendar year 2001, County agency locations recycled approximately 811 tons of materials. DSWCR provides all backup support to ensure adequate communication of the recycling requirements as well as operational support for general programs or other special activities as needed.

4. Public Education

Education forms the basis of any County's public outreach effort. To that end, DSWCR focuses on the development and implementation of creative education programs that can take advantage of our partnerships with County agencies, Fairfax County Public Schools, commercial businesses, and private haulers. DSWCR's outreach programs consist of attendance at County events, the support and advertisement of several days every year specifically dedicated to recycling efforts, public speaking opportunities, and technical support of recycling activities and issues.

a. Annual Events

Annually, the Solid Waste Program participates in Clean Fairfax Council's Earth Day/Arbor Day event, Celebrate Fairfax, and Fall for Fairfax. These events are a major portion of our overall public outreach campaign and provide the program with the opportunity to provide technical guidance as well as practical information about the County's solid waste and recycling programs. In FY 2002, the Solid Waste Program won the Best of Show Award at the Celebrate Fairfax Event in June with an interactive

display of equipment and programs.

DSWCR also promotes an annual Clean Your Files Day (geared to County agency staff to remind staff of the benefits of recycling of office paper) and America Recycles Day (November 15), when recycled products purchasing is emphasized.

b. Public Outreach

Public outreach and education is accomplished through involvement in community events and public speaking opportunities as well as the Solid Waste Program's membership in the Lorton Citizens Alliance Team (LCAT). DSWCR is asked to make presentations to a variety of citizen's groups every month of the year, and they make every effort to accommodate the quantity of requests. DSWCR has prepared formal presentations on a variety of issues to allow ease of presentations, even upon short notice.

DSWCR is in the process of updating all of the written publications to account for changes in programs and activities. Publications are being rewritten to ensure the clarity of the contents and that they are informative and present information in a suitable fashion to address a particular question or issue. All publications will eventually be available on the County website to allow for the ease of access and printing for distribution. Additionally, the County maintains an automated recycling information line (324-5052) for citizen access to recycling opportunity information.

The Solid Waste Management Program is taking full advantage of the internet by placing pertinent information about timely subjects on its website. Information about the Program's involvement in events as well as new information about recycling is constantly updated on the web.

DSWCR is also using the web to collect information form citizens as well as the regulated community as a service to its customers to aid in the provision of information back to the County. The forms developed by DSWCR to collect data from recyclers in the County used to calculate the recycling rate are on the website in a format which automatically totals the tonnages of recyclables collected. More opportunities to use the internet will avail themselves as technology advances.

The County will be embarking on a public-private partnership to collect unwanted computers and other discarded electronics for ultimate recycling to assist in local pollution prevention efforts. Opportunities for the collection and recycling of other recyclable commodities not collected curbside or at the RDOCs will be explored for implementation on a regularly-scheduled basis within the County as determined by need.

C. LEGISLATION AND REGULATORY CHANGES

There have been several notable changes, along with proposals to change regulations, during the past year that have affected the solid waste management program. These are listed below:

- Solid Waste Management Plan – The Virginia Waste Management Board promulgated new regulatory requirements (9 VAC 20-130-10) that require all of Virginia's Cities, Towns and Counties to develop new Solid Waste Management Plans. These Plans are required to be submitted to the Virginia Department of Environmental Quality by June 2002. The plans will span a 20-year planning horizon and will focus on all types of solid waste generation within a City, Town, County, or Planning Area. Fairfax County is "gearing-up" to begin preparing the plan for the County, and this will involve selecting a consultant to assist staff with plan preparation and public outreach.

- SB 592 – In early April 2002, the Governor introduced substitute language for an existing Senate Bill which would have levied a $5 per ton surcharge on all waste deposited in Virginia's landfills. The bill, as proposed, exempted waste-to-energy facilities, but would have applied this fee to the ash that is deposited into landfills. For Fairfax County, this would have amounted to a payment of approximately $1.8 million to the State. The fee was proposed primarily to go back to local governments for open space preservation and land conservation projects, as well as local recycling support. The proposal was defeated in Virginia's Senate, but was carried over for future discussion and consideration.

- Amendment No. 3 to the Solid Waste Management Regulations – Major modifications were proposed by DEQ to these Regulations. The original proposal would have placed undue hardship on local governments to site and develop new waste disposal units. The regulatory changes were initially proposed as the result of Virginia General Assembly previously approved legislation to require DEQ to certify need for new waste disposal facilities. Revised regulatory language that is more acceptable to local governments has been developed by DEQ and has been sent to the State's Department of Budget for review prior to promulgation.

D. RECOMMENDATATIONS

1. EQAC is very pleased that the County took the initiative to acquire backup capacity in the event that Energy/Resource Recovery Facility (E/RRF) issues arise in the future. The County could benefit from applying a thorough "Futures Analysis" or "Risk Analysis" of the overall program to look for additional potential weaknesses and to develop action plans for any apparent weaknesses.

2. EQAC continues to be concerned with the economics of waste disposal in Fairfax County. Based on pending legislation and financial considerations, pressure to increase costs to residents is rising. EQAC would like to assist the two divisions responsible for solid waste management in an assessment of efficiency and cost avoidance of the entire system. We feel that business processing re-engineering could yield options to consider in a cost benefit analysis.

3. EQAC remains opposed to any action to subsidize tipping fees in the County, and we do not support any proposal that would reduce the effectiveness of recycling programs by redirecting waste paper products to the Energy/Resource Recovery Facility (E/RRF).

LIST OF REFERENCES

The narrative and illustrations were supplied by the Division of Solid Waste Collection and Recycling and the Division of Solid Waste Disposal and Resource Recovery.

CHAPTER VI

HAZARDOUS MATERIALS

VI. HAZARDOUS MATERIALS

A. ISSUES AND OVERVIEW

1. Overview

Fairfax County hazardous materials (HAZMAT) concerns may be considered less significant as compared to other jurisdictions; the industrial base within the County is relatively "clean". Nevertheless, the County does have its share of problems. The main concerns are hazardous materials incidents involving spills, leaks, transportation accidents, ruptures, or other types of emergency discharges. Secondary is the use and disposal of hazardous materials in either daily household activities or by small quantity commercial generators. The final concern is the clean up and regulation of hazardous materials.

During the year 2001, Fairfax County handled some unique hazardous materials issues. During the consideration of an amendment to the County's Zoning Ordinance, the County studied the environmental effects of Perchloroethylene (also called PERC or tetrachloroethylene), a chemical used by dry cleaners located in residential neighborhoods. After September 11th and the October Anthrax incidents, Fire and Rescue responded to numerous "white powder/suspicious item" reports throughout the County. The Federal government used a site within the County for Anthrax Decontamination as well.

Although the news media is constantly reporting industrial and transportation related hazardous materials incidents, there is a general lack of awareness by the public of health and safety risks associated with the use, storage, and disposal of common household hazardous materials. Educating the public on the implications of these hazardous materials on peoples' lives remains a significant goal.

2. Hazardous Materials Incidents

Fairfax County Fire Chief Edward L. Stinnette reports the following:

> "The Fire and Rescue Department Operations and/or Hazardous Materials and Investigative Services Section respond to all reported incidents of hazardous materials releases, spills and discharges. The County has a well-equipped hazardous materials response team. The primary unit operates from Fire Station 34 in Oakton and three satellite units are stationed at Fire Station 1 in McLean, Fire Station 11 in Alexandria, and Fire Station 26 in Springfield. These units are strategically positioned to provide rapid response and adequate coverage throughout Fairfax County. Response

personnel are trained and equipped to initiate product control and mitigation measures to prevent or minimize the adverse environmental impact and damage.

The Hazardous Materials Response Team responded to 710 incidents in CY 2001. These incidents included the release of products into the air, water, and soil. The majority of the incidents continue to be hydrocarbon and corrosive releases. In addition, there were hundreds of small releases such as gasoline, diesel fuel, antifreeze, [and] hydraulic fluid that were handled by first responder units. In CY 2000, the Fire and Rescue Department placed in service a Spill Control Unit at Fire Station 35. This unit carries bulk supplies for spill control, absorption, and containment efforts. The team conducted regular training sessions, as well as practical exercises, with surrounding jurisdictions, and state and federal agencies.

In addition to the efforts of the Operations Division and Hazardous Materials Investigative Services Section personnel, the Fire and Rescue Department maintains a contract with a major commercial hazardous materials response company to provide additional support for large-scale incidents. The Fire and Rescue Department is committed to protecting the environment and the citizens through proper enforcement of the code or rapid identification, containment, and cleanup of hazardous materials incidents.

The Hazardous Materials and Investigative Services personnel respond to reported incidents and investigate complaints of potential and actual releases, many of a non-emergency nature. During CY 2001, response incidents, which had the potential to discharge hazardous materials into storm drain or surface water, included: 68 improper disposal; 2 pipeline incidents; 90 various types of produce releases, and 203 petroleum releases." (1)

From the preceding year, the number of improper disposals more than doubled and the number of various types of product releases and the petroleum releases more than tripled.

3. Anthrax

The Fairfax County Fire and Rescue Department reported the following:

"Beginning on October 13, 2001 Fairfax County experienced a phenomenon of public anxiety and fear that has not occurred in the recent past. From October 13th to December 31, public safety agencies responded to over 1,800 suspected anthrax or 'white powder' incidents.

Fire and Rescue had established response procedures for biological incidents almost two years before this rash of events. In the past, however, only single events were encountered and nobody had envisioned the large number of 'good intent,' yet false calls, hoaxes, and credible incidents. Public safety agencies were required to place additional staff and units in service in order to meet the response demands. The Health Department established an "Anthrax Hotline" to address citizen's questions and concerns.

The scope of the problem as well as the overwhelming number of calls required a coordinated effort from County agencies including, Office of County Executive, Office of Public Affairs, Fire and Rescue, Police Department, Health Department, Emergency Management, and others. Numerous meetings were conducted to develop a strategic plan that ensured the following:

- Protect the public and responders through safe and effective emergency response
- Provide accurate information and recommendations to the public in a timely manner
- Manage the distribution of medications if necessary
- Investigate and prosecute any criminal activities, i.e. threats, hoaxes
- Provide follow-up services as necessary

The Board of Supervisors scheduled public forums in the various districts in order to provide information on anthrax and emergency preparedness in general.

The Board of Supervisors and County agencies also provided oversight to several anthrax remediation efforts (investigations, decontamination of mail) that were located in, or proposed for the County." (2)

Information about Anthrax and biological agents can be found on the INOVA web site: www.inova.org and the Center of Disease Control web site: www.cdc.gov.

The Fire and Rescue Department received funding to increase its mass decontamination capabilities, to purchase additional substance investigation instrumentation, and to enhance computer technology. In addition, the Federal grant funds available to Fairfax County will be used for communication upgrades, upgrades to the Emergency Operation Center, and the purchase of HAZMAT clothing and equipment. Funds have been identified for large-scale activities that will be useful for many different circumstances including terrorism.

4. Hazardous Materials in the Waste Stream

The disposal of household and small quantities of non-household hazardous materials into the waste stream continues to be a concern. Unlike hazardous materials incidents, the immediate impact is not as dangerous. However, the long-term impact can be just a severe. Hazardous materials in the waste stream are contaminating landfills. Sometimes hazardous materials are dumped illegally, which leads to stream and groundwater pollution and soil contamination. Household hazardous wastes are products used in and around the home that are flammable, corrosive, reactive, or toxic. These hazardous materials potentially can cause a safety problem if various household chemicals become mixed when disposed of with the regular trash. By disposing of household hazardous wastes separately in the appropriate manner, these materials can be properly handled and packaged to minimize exposure to potentially harmful chemicals and decrease the likelihood that these chemicals will enter the environment.

a. Used Automotive Oil and Fluids

A recent year-long study by the Northern Virginia Planning District Commission (NVPDC, now the Northern Virginia Regional Commission, or NVRC) for the Department of Environmental Quality estimates that approximately three to 4.5 million gallons of used oil, and approximately one million gallons of antifreeze, are "lost" in the environment each year through improper disposal by "do-it-yourselfers", or DIYers. DIYers change their own automotive fluids (including oil, oil filters, and antifreeze) and account for 40 to 50% of those owning passenger cars. Only 15 to 30% of DIYers are believed to properly recycle or dispose of used oil. One percent or less of DIYers recycle oil filters.

This study resulted in a recommendation to reestablish a Statewide used oil recycling program aimed at capturing what amounts to the 1989 Exxon Valdez oil spill every four years. As a part of the study, NVPDC developed a database of all known collection centers in Virginia – 471 private and 125 public. The study also revealed that there are about the same number of collection facilities in 1999 as in the late 1980s; however, the volume of oil generated has increased roughly 100,000 gallons per year because of more cars on the road. Convenience and public education were found to be major factors in whether DIYers recycle or not. (3)

b. Dumping into Storm Drains

Storm drains carry stormwater runoff from streets (see the Water Resources chapter of this report). This water is not treated and goes directly into local streams. All streams in Fairfax County eventually flow into the Potomac

River, which empties into the Chesapeake Bay. Anything dumped down a storm drain will follow the same path as the stormwater runoff. (4)

The cleaning up of animal waste and the disposal of such wastes down storm drains, as well as the disposal of leaves down the storm drains, are attempts at doing a service that have the effect of introducing pollutants directly into County streams. There are deliberate disposals of chemicals, oils and other items into the storm drains as "out-of-site, out-of-mind". In either situation, there is a misperception that the storm drains are part of the County sewage system and that the disposal of materials down these drains does not provide a direct impact to the environment.

5. Pipelines

The following was reported by the Fairfax Joint Local Emergency Planning Committee:

> "More than 3,000 companies operate some 1.9 million miles of natural gas and hazardous liquid pipelines in the United States. The pipeline network includes 302,000 miles of natural gas transmission pipelines operated by 1,220 firms, and 155,000 miles are hazardous liquid transmission pipelines operated by 220 outfits. In addition to transmission pipelines, 94 liquefied natural gas facilities operate in the United States." (5)

Pipelines traverse Fairfax County carrying refined petroleum for two companies and natural gas for three companies. The Office of Pipeline Safety in the U.S. Department of Transportation regulates pipeline design and the construction, operation, and maintenance of pipelines to ensure safe transportation of hazardous liquids and natural gas. (6)

6. Rail Transport of Hazardous Materials

Chemicals and materials that are hazardous have regularly been transported by rail. Accidents or leaks have been, and continue to be, a cause for concern. Post September 11 has introduced additional concerns.

Potential future shipments of nuclear radioactive waste by rail (and by truck) will travel through parts of the Washington, D.C. metropolitan area. Should an accidental or intentional incident occur, the effects and impacts could extend beyond that initial area.

The July 18, 2001 CSX Train fire in a Baltimore, Maryland tunnel was an unintended incident involving a train car with hazardous materials and had wide-range, long-term consequences. Major sections of the downtown were closed, businesses were impacted, Orioles' games had to be rescheduled, and portions of a major street were closed for five weeks.

Rail through Fairfax County is in the eastern and southern portions of the County and does not include tunnels. Residents are generally not located as close to the rails in Fairfax County as in other jurisdictions. However, some hazardous materials, alone or in combination, when released can affect areas up to miles from the initial site of the incident. It is conceivable that Fairfax County residents could be impacted with hazardous materials from a rail incident in another jurisdiction.

B. PROGRAMS, PROJECTS, AND ANALYSES

1. Fairfax Joint Local Emergency Planning Committee (FJLEPC)

The FJLEPC is comprised of representatives of the City of Fairfax, the towns of Herndon and Vienna, Fairfax County, and local business and citizens groups. The Virginia Emergency Response Council appoints representatives. LEPCs are required by Section 301[c] of Title III of the Emergency Planning and Community Right-to-Know Act (EPCRA), a freestanding provision of the Superfund Amendments and Reauthorization Act of 1986 (SARA). The committee is responsible for preparing and annually updating the Hazardous Material Emergency Response Plan (HMERP). The FJLEPC also is required to compile information on the facilities within its jurisdiction that use, store, or manufacture hazardous materials in amounts equal to or greater than the threshold planning quantities (TPQ). Businesses with extremely hazardous materials with over the TPQ amounts must prepare a Hazardous Materials Response Plan. The plan consists of notification procedures in the event of an incident, on site means of detecting incidents, evacuation plans, clean-up resources, and identification of parties responsible for the site.

FJLEPC conducted a HMERP exercise on September 29, 2001 at the Exxon facility located at the Newington Tank Farm. The exercise was a multi-agency, single jurisdiction exercise that simulated a fire at the tank farm. The Fire and Rescue units used their incidents management training, the FJLEPC HMERP, and the facility preplan to practice tactical exercises and identify environmental issues.

Another non-FJLEPC exercise was conducted on September 8, 2001 with participation from local, state, and federal agencies. FJLEPC member agencies also participated. It was a Sarin Release Exercise that had approximately 90 patients. The exercise included identification of the hazardous materials, determining the proper antidote, and decontamination procedures. These exercises allow emergency personnel to practice plans and basic principles that apply in any emergency situation, including terrorism.

FJLEPC provides education and outreach to the public. Information is disseminated through fliers, FJLEPC's newsletter, and its web site:

http://www.lepcfairfax.org. Two newsletters were mailed to over 1,500 homeowner associations, providing citizens with useful hazardous materials information and educating them about hazards in the home. The newsletters also provide information on the proper disposal of, and regulatory issues with regard to, hazardous materials. (6) FJLEPC is available to speak to groups and is planning to update the citizen brochures on reporting hazardous materials incidents and dealing with evacuation.

2. Railroad Transportation Plan

The CSX Transportation, Hazardous Material Systems, has a hazardous material emergency response plan. A written copy of that plan is on file with FJLEPC and the Fairfax County Fire & Rescue Hazmat Station 34. The web site for CSX is: www.csx.com

3. Storm Drain Stenciling Program

The Northern Virginia Soil and Water Conservation District (NVSWCD) has a Storm Drain Stenciling Program which encourages youth and community groups to educate the public about the dangers of dumping anything into storm drains. This is a two-part program that includes education and stenciling of the drains. The mandatory educational component must be completed prior to stenciling, and includes distributing flyers to all homes in the neighborhood regarding how to properly dispose of household and pet waste, yard debris, and used motor oil. Trained volunteers then stencil "Dumping Pollutes – Drains to Stream" on storm water inlets in pre-approved (Virginia Department of Transportation--VDOT) areas. This program has proven to be an effective, low-cost method of educating large segments of the population about water quality problems. NVSWCD has reported that, last year, more than 1,100 households were educated with this program. (7)

4. Household Hazardous Waste Program (HHW)

Fairfax County operates permanent HHW collection centers as a part of its recycling program for residents of Fairfax County. Information on the locations, hours of operation, types of wastes accepted and how to dispose of the wastes can be found on the County's web site www.co.fairfax.va.us. This information can be found under Public Works and Utilities and under Environment.

Participation in the HHW collection program has resulted in many items being disposed of at the centers that are not hazardous waste. In addition to the confusion of what should be recycled as HHW, the inconvenience of not having collection sites located throughout the County may be affecting the participation.

In FY 2002, there were 16,272 participants disposing of 368,060 pounds of HHW. This included 5,955 gallons of antifreeze, 76,007 gallons of motor oil, 6,197 lead acid battery cores, and 59,980 gallons (or 150 tons) of latex paint. This is a slight increase from FY 2001, when there were 15,312 participants disposing of 356,275 pounds of HHW. That included 6,250 gallons of antifreeze, 59,868 gallons of motor oil, and 57,375 gallons of latex paint. FY 2001's totals are approximately the same as the totals for the three preceding years. (8) Considering the population and business growth in the County during this five-year period, HHW recycling does not seem to be keeping pace.

5. Commercial Hazardous Wastes

The Conditionally Exempt Small Quantity Generator (CESQG) program has been reestablished on a limited bases. A CESQG is any business that generates less than 220 pounds or 27 gallons of HAZMAT during a month. There is a fee for disposal of HAZMAT that the CESQG pays directly to the contractor operating this program. Commercial hazardous waste generators that do not qualify as CESQGs should look to commercial hazardous waste disposal companies for support. For more information about CESQG and a list of commercial hazardous waste disposal companies, access the County's web site. (9)

C. REPORTING ENVIRONMENTAL CONCERNS AND ISSUES

Environmental issues affect everyone living and working in the County. All environmental concerns and events negatively impacting the County should be reported. A list of contact information relating to environmental crimes is provided in Table VI-1 below.

D. LEGISLATIVE UPDATE

During 2001, there were no legislative issues and/or regulatory changes with regard to hazardous materials.

Table VI-1

HOW TO REPORT ENVIRONMENTAL CRIMES

Type of Incident	Phone Number
ANY ACTIVE RELEASE OF MATERIALS INTO THE ENVIRONMENT If the dumping of any substance into a stream, into a manhole, into a storm sewer, or onto the ground is witnessed, assumptions regarding the contents of the materials should not be made. 911 should be called immediately. When calling 911, be prepared to provide specific information regarding the location and nature of the incident. The local office of the U.S. Environmental Protection Agency (703-235-1113) can be called in addition to (but not instead of) 911.	**911**
HAZARDOUS MATERIALS-DANGEROUS If a suspected hazardous substance is being released, if lives are in danger, or if property is threatened, 911 should be called immediately. It is also appropriate to call 911 anytime an active release is witnessed.	**911**
HAZARDOUS MATERIALS-NO IMMEDIATE DANGER If a known discharge of hazardous materials has occurred in the past and no lives or property are in immediate danger; this must be reported to the Fairfax County Fire and Rescue Department's Hazardous Materials and Investigative Services Section at this number (includes Towns of Clifton, Herndon, and Vienna). If there is any question about whether a release may still be active or whether there may be any immediate danger, 911 should be called.	During working hours, call: **703-246-4386** After hours, call: **703-691-2131**
RELEASE OF ANY MATERIAL INTO THE ENVIRONMENT Any release of materials into the environment, whether hazardous or not, should be reported to the Northern Regional Office of the Virginia Department of Environmental Quality at the above number. If the release is an active one, call 911.	**703-583-3800**

Table VI-1 (continued) HOW TO REPORT ENVIRONMENTAL CRIMES	
Type of Incident	**Phone Number**
EROSION AND SEDIMENTATION If the illegal removal of trees, the illegal clearing of land, and/or the illegal dumping of fill is suspected, contact Fairfax County's Code Enforcement Division at the number above. This number should also be contacted if siltation and other harmful effects of construction activity are occurring or observed on neighboring lands and waterways. All calls received during non-working hours will be responded to during the next business day.	**703-324-1937**
HEALTH HAZARDS In addition to the above contacts, if a health hazard is suspected, contact the Environmental Health Administration at the above number. The Health Department's Community Health and Safety Section (703-246-2300) can also be called. Asbestos-specific releases should also be reported to the Health Department.	**703-246-2205**

E. RECOMMENDATIONS

1. EQAC recommends an aggressive public education campaign on how to properly dispose of household/residential, commercial, and industrial hazardous waste. A "How To" chart that can be easily read and kept for continued reference is suggested. Partnering with groups and businesses to provide the money and much of the work is suggested

2. The reporting of PERC (Perchloroethylene) releases is limited to those incidents where the business, usually dry cleaners, is currently operating. Ground contamination from businesses no longer in operation are only reported if the chemical has reached a water source or affects another property. EQAC recommends the reporting of all ground contamination that requires environmental cleanup prior to land use applications.

3. Environmental crimes require citizens' eyes. EQAC recommends an advertisement and educational campaign to state what types of hazardous materials and other environmental situations citizens are requested to report including who they are to contact. This could be done through community association newsletters, press release story to the media, and age appropriate material sent home through the schools.

REFERENCES

1. Fairfax County Fire & Rescue, Chief Edward L. Stinnette, April 26, 2002 memo.

2. Fairfax County Fire and Rescue Department; correspondence to Noel Kaplan, Fairfax County Department of Planning and Zoning

3. Northern Virginia Planning District Commission, *Nvironment*, Vol.12, Number 1, Fall 1999, p1.

4. Northern Virginia Soil & Water Conservation District, *1999-2000 Annual Report*, page *10.*

5. *LEPC Connection: A Virginia Local Emergency Planning Committee Newsletter*, Fall 2000, p 1.

6. Fairfax Joint Local Emergency Planning Committee

7. Northern Virginia Soil & Water Conservation District

8. Fairfax County Division of Solid Waste, Disposal and Resource Recover, HHW Disposal Program, Cliff Taylor, June 30, 2002 memo

9. Fairfax County Web site:
   www.co.fairfax.va.us/dpwes/trash/disposal%Fhazcommer.htm

10. Previous EQAC authors of this chapter and material

CHAPTER VII

NOISE, LIGHT POLLUTION, AND VISUAL POLLUTION

VII-1. NOISE

A. OVERVIEW

Addressing and solving any environmental noise problem involves two initial steps:

- Quantify the problem using noise measurements or analytical means
- Determine the applicable criteria, goals, or noise limits.

The first step, quantifying sound, is usually straightforward; the second step, finding an applicable limit, is also made simple if the community affected has in place a well-written and workable environmental noise ordinance or guideline. With "global" environmental noise sources, such as highways, railroads, and aircraft, the primary responsibility lies with federal authorities to provide the necessary regulatory guidelines. The task of establishing applicable guidelines and limits is increasingly being delegated to state authorities under the supervision of the appropriate federal agencies. The knowledge of how to measure and control environmental noise is a professional expertise that is readily available throughout the country. Most practicing acoustical consultants, architects, and engineers, and those working at universities and federally supported research centers throughout the country, agree that we are well-prepared to make the 21st century a "quiet" one. Yes, the invisible pollutant of environmental noise can be tamed.

Fairfax County, Virginia has its share of “Noise” sources as the reader shall learn in the following pages. However, Fairfax County has focused on the two largest sources of environmental noise. The Annual Report will focus its attention on aviation generated and highway generated noise, but this chapter will focus on just the aviation sources of noise in the County.

Fairfax County is served by Ronald Reagan Washington National Airport and the John Foster Dulles International Airport. Typically, more than 60,000 flights will be conducted each month at National and Dulles Airports. However, operations at Reagan National since September 11, 2001 were far below normal.[1]

Figure VII-1-1

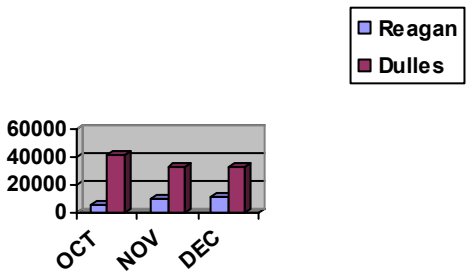


Figure VII-1-1 illustrates the traffic levels of the two airports during the months of October, November, and December of 2001. At least 90% of the flights counted for Reagan National were Air Carriers and Commuter flights while more than 85% were the same categories at Dulles.

[1] MWAA, “Flight Operations and Aircraft Noise Quarterly Report of Washington Dulles International Airport and Ronald Reagan Washington National Airport”; October, November, December 2001

Departing and arriving air traffic generates high levels of environmental noise within a several mile radius of each airport. Recognizing that economy of Northern Virginia has and would continue to be seriously impacted by flight reductions, the EQAC will offer a series of recommendations aimed at brokering an understanding with airport authorities that the County's residents need the capital infusion of the airports, but the aviation industry must appreciate our need for tolerable environmental noise generated by airports.

One hundred and fifty two of the 310 noise complaints processed by the Reagan National Airport Complaint Center were generated by Northern Virginia residents while 69 of 79 complaints received by the Dulles noise complaint center originated from Virginia residents. These statistics were generated from 75 and 69 Virginia callers to the Reagan National and Dulles Airports, respectively.

Reagan National has one of the strictest noise regulations in place at any major airport in the USA. All night aircraft operating between 1:00 P.M. and 7:00 A.M. must satisfy the Airport's night-time noise limits or face monetary fines of $5,000.00 maximum per violation. In 2001, there were nine violations during the first nine months (pre 9/11). Due to heightened security, Reagan National was closed from September (post 9/11) through the end of 2001. In fact, the airport is still struggling to achieve its usual flight load to this day. During the period when Reagan National was operating, civil penalties were sought for 3 violations and 6 letters of warning were issued. Two of those cases remained open through the end of 2001, and we have no word that they have been resolved to date. The civil penalties for the one case were approximately $4,000.00.

The Metropolitan Washington Airports Authority (MWAA) monitors aircraft and community nose around the clock at 32 locations in the metropolitan area of Washington. The monitoring equipment evaluates different sound events and separates those events likely to have been caused from aircraft from the remaining events which are attributed to the community. Based on the data provided by the MWAA, it appears that there were zero violations their statistics reveal that at least one caller to the Dulles Complaint Center made five independent complaints. From practical experience living in Sully District, the noise levels experienced vary with the weather conditions. Generally, take offs and landings of large aircraft can be heard, but those same generators produce audible noises much greater than during calm weather conditions.

The FAA uses as a baseline when determining compliant noise levels at 65 dB. Reviewing data for the final quarter indicates that DNL registered at any of the 32 monitoring sites in Virginia exceeded 65 dB by at least 3 dB on at least 11 days in October, 8 times in November, and 6 times in December. Two readings during this time period reached approximately 78 dB or roughly 13 dB above the "safe" level. The reader is cautioned to view these values in view of the fact that air traffic had been halted to a large extent during this period as fall-out from the 9/11 terrorist attack.

B. NOISE—WHAT IS IT?

Environmental noise in and around buildings and communities in which people live and work has gradually and steadily increased in magnitude and diversity as civilization has advanced. The industrial growth and introduction of railroads in the 19th century accelerated the pervasiveness of environmental noise. In the 20th century, industrial growth even more dramatically exposed larger and larger segments of the population to noise, especially from the new mode of transportation-aircraft. In particular, the introduction of jet aircraft into the civil fleet in the late 1950s and early 1960s spurred the scientific- technical community, as well as the political leader-ship, to look for solutions to the growing problem of aircraft noise and environmental noise in general. In the 1975 survey, it was shown that aircraft noise is one of the leading factors in making people want to move from their neighborhoods. Approximately one-third of all the respondents who wished to move because of undesirable neighborhood conditions did so because of noise. Noise has been consistently ranked as a leading cause of neighborhood dissatisfaction. In fact, nearly one-half of the respondents each year have felt that noise was a major neighborhood problem.

From the moment of birth we are literally and figuratively immersed in a sea of sounds. We quickly learn that sound is essential for us to communicate with one another, to enjoy drama and musical performances, as well as recorded symphonies, jazz or rock music, and to appreciate countless other sounds we want to hear. Some loud sounds are necessary to warn us of oncoming potential danger, such as at a train crossing or at a construction site where a backing vehicle may be about to cross our path. One has only to be deprived of one's hearing, even temporarily, or to know someone who is severely hearing-impaired to realize how precious the gift of hearing truly is.

But some sounds around us may interfere with our ability to communicate. They may mask our enjoyment of desirable sounds; they may interfere with our ability to concentrate on a task or to learn a new one. Other sounds may startle us, interrupt our sleep, cause us psychological stress, contribute to physiological distress and, when sustained and loud enough, contribute to temporary or permanent loss of hearing. These latter sounds are "unwanted" and, by definition, are considered noise.

C. NOISE—WHO REGULATES IT?

The steadily growing concern for and adoption of means to control environmental noise are everywhere evident. The fact that the noise output of the larger and more powerful jet engines necessary to serve the nation's insatiable demand for air travel has not increased with the increased mechanical power of the jet engines themselves is evidence that the nation's efforts to control noise have been productive. In fact, aircraft noise exposure in communities around airports has for the last ten years been on the decrease, as quieter aircraft become more prevalent, even though air traffic has been on the increase. The FAA's "quiet engine" research and development program began long ago, and its multitude of other aircraft and airport noise abatement research programs have led to vastly quieter

aircraft operations than would have been the case without the continuing efforts to address the thorny issues of environmental noise.

Many people think of the Occupational Safety and Health Administration (OSHA) when they think of protecting workers' health, but it can be shown that other organizations, namely the Environmental Protection Agency (EPA) and American National Standards Institute and National Institute for Occupational Safety and Health (ANSI/NIOSH), have safer standards which include a larger margin of safety.

Protecting the health of the population is and continues to be the primary motive of all public efforts to control individual and community exposure to noise. The United States has adopted the World Health Organization's (WHO) broad definition of health as not the mere absence of disease, but as the total physiological and psychological well-being of the citizenry. Congress enacted the Environmental Protection Act of 1969 and the Noise Control Act of 1972 to mandate and implement practical and achievable standards and policies to ensure that the broad public health and environmental objectives with respect to individual and community noise are met. The United States Environmental Protection Agency (EPA), which grew out of the 1969 environmental legislation, assumed responsibility for coordinating the development of noise policies, standards, and guidelines in cooperation with several major federal agencies. Chief among them are the Federal Aviation Administration (FAA) and others having cognizance over major sources or receptors of environmental noise.

D. QUANTIFYING SOUND: A BIT ABOUT THE NUMBERS

MWAA employs two metrics that are used to determine the impact of aircraft noise in our area. The first is the Day-Night average sound level (DNL). This is the measure preferred by the FAA. The second metric provides the actual noise level that was exceeded for a particular percent of time of the reporting period (1 month). The following provides the reader with a basic understanding of the significance and value of the many different metric.

The full, audible frequency range for young, healthy ears extends from about 20 Hz (cycles per second) to about 20,000 Hz. However, the human hearing mechanism is most sensitive to sounds in the 500- to 8,000-Hz range. Above and below this range, the ear is inherently less sensitive. With increasing age, the ear becomes progressively less sensitive to sound over the entire frequency range (presbycusis). Persons who are exposed to loud noise over a long period of time can also incur a hearing loss that usually most significantly affects hearing acuity in the mid- and high-frequency ranges. To account for the varying sensitivity of the normal human ear to sound over the audible frequency range, sound level meters incorporate an electronic filter (or weighting network) that approximates the way the human ear perceives sound over the audible frequency range. Sound level values obtained using this weighting network are referred to as "A-weighted" sound levels and are signified by the identifying unit, dBA. To give some perspective to this simple sound level descriptor, Figure 1 shows A-weighted levels over the full dynamic range of human hearing, from very

quiet concert halls and recording studios at about 20 dBA, up to levels of 130 dBA that would cause pain and potential hearing damage, even for short time exposures.

Both indoor and outdoor environmental sound levels usually vary markedly with time, whether in a relatively quiet setting such as in a remote rural area or in highly developed downtown urban community. With such time-varying sound, as with the weather, there is no simple convenient metric to completely describe the quality and quantity of sound energy present.

E. NOISE SUPPRESSION/ABATEMENT GUIDANCE

1. Federal Aviation Administration

The FAA does not specify aircraft noise exposure limits for communities near airports. Instead, the FAA sets limits on noise emissions from individual types of aircraft and sets deadlines for permitted operation of aircraft at U.S. airports that do not conform to these limits. Aircraft noise emission limits are important to communities around airports, but they are also important to airport planners who need to evaluate the noise impact of changes in airport operations produced by changes in facilities and normal growth in air traffic. Most airports, even smaller general aviation airports, maintain an airport master plan. An airport master plan is a written document that outlines all aircraft operations, assesses environmental effects including noise, and forecasts future airport growth.

Airport noise exposure information is normally presented as yearly day-night average sound level contours overlain on a map of the area. L_{dn} contours are normally presented in 5 dB increments beginning with the 65 dB contour. Some major airports have L_{dn} contours as high as 80 dB close to the ends of major departing runways. These maps are used by architects and engineers to interpolate aircraft day-night average sound levels at their project sites in the vicinity of airports. This information is used to evaluate the need for special sound isolation wall and window constructions to protect interior spaces of the building from excessive aircraft noise (Table VII-1-1).

F. THE POTOMAC CONSOLIDATED TRACON AIRSPACE REDESIGN ENVIRONMENTAL IMPACT STATEMENT (EIS)

In our 2001 *Annual Report*, EQAC briefly discussed the EIS project. In January 2002, the US Department of Transportation, Federal Aviation Administration, published a two volume report of the Draft EIS. For purposes of our 2002 Annual Report, we have extracted conclusions and recommendations from the report's "Executive Summary" dated January 2002. The Draft EIS is under peer review; Fairfax County Staff prepared an

Table VII-1-1

Possible Airport Noise Abatement Actions

Airport Feature and Activity	Possible Noise Abatement Actions
Flight Tracks	Direct aircraft away from populated areas
Preferential runways	Foster use of runways with least impact
Restrict noisy aircraft	Minimize operations during day or night
Noise abatement flight procedures	Require use of noise abatement throttle and flap management procedures for takeoff and/or approach
Airport layout	Extend or build new runways and taxiways to make best use of compatible land and water
Shielding barriers	Shield people from noise of ground operations
Building soundproofing	Soundproof schools, homes, and churches
Land use control	Ensure compatible land use through acquisition of property or other rights
Monitor and model	Monitor airport noise and flight tracks to provide data to the public and for evaluating proposed alternatives
Communications	Listen to complaints and suggestions; develop and institutionalize continuing effective dialogue and information transfer among all concerned parties

Source: Cavanaugh, William J. and Gregory C. Tocci, *Environmental Noise: The Invisible Pollutant*, E_2SC, Volume 1, Number 1, USC Institute of Public Affairs, Fall, 1998.

assessment of the 2-Volume report with the assistance and input from a number of agencies in County government, EQAC, and others.

The proposed action is to redesign the airspace in the Baltimore-Washington metropolitan area excluding noise abatement procedures. This involves new routes, altitudes and procedures to take advantage of the newly consolidated TRACON, improved aircraft performance and emerging ATC technologies. Essentially, before the TRACON was established at the Vint Hill Farms in Fauquier County, Virginia, there were four independent TRACONs for each of the BWI, Dulles, Regan National and Andrews Air Force Base, Maryland airspace. Later in the study, the Richmond area was added to the study area. Many other smaller airports within the study area were included as well. The concept of the consolidated TRACON is that one control center would do a better job of controlling aircraft in, around and out of the affected airspace, a 75-Nautical mile radius

centered on a radio navigational aid (NAVAID), Non-Directional Beacon (NDB) in Georgetown, within the District of Columbia. The study area comprises portions of five states – Delaware, Maryland, Pennsylvania, Virginia and West Virginia. The study tiers off the former EIS study that considered locating a single TRACON in the same area. That process resulted in the FAA issuing a Record of Decision (ROD) documenting that consolidation the four existing TRACONs into the new facility at Vint Hills. Subsequent to the ROD, it was decided to add the Richmond, Virginia TRACON into this current study.

A total of 19 impact categories are addressed in the current EIS using criteria defined in the FAA Order 1050.1D, Change 4 "Policies and Procedures For Considering Environmental Impacts." The study team evaluated 4 Alternatives against the FAA criteria. For the purpose of the EIS, increases of 3 dB in areas that would be exposed to DNL between 60 and 65 dB were considered to have slight-to-moderate impacts. Increases of 5 dB or greater in areas that would be exposed to DNL between 45 dB and 60 dB are also considered to be slight-to-moderate impacts. The increase in noise at these levels is enough to be noticeable and potentially disturbing to some people, but the cumulative noise level and the magnitude of the change are not high enough to constitute a significant impact. The conclusions of the Draft EIS follow:

- The proposed alternatives do not result in significant noise impacts
- There would be no significant impacts as it relates to compatible land uses.
- The Alternatives would not impose a change that would disproportionately impact minority or low-income households for any of the impact categories considered.
- Will not adversely affect historic and cultural resources.
- Impacts to migratory birds in Fairfax County would be minimal and not significant.
- None of the alternatives would result in negative air quality impacts due to the fact that the proposed alternatives are intended to accommodate current and forecasted demand.

G. HIGHWAY NOISE

1. Background

Traffic in the Washington metropolitan area, including Fairfax County, continues to grow with intense residential development in Loudoun and Prince William Counties. The area ranks second nationally for the worst commuting times behind Los Angeles. As more lanes are added and some new roads are constructed, increased traffic generates more noise that creates demands for noise attenuation or abatement measures. These measures include separating the receiver from the source by distance, constructing barriers/walls or berms, providing landscaping/vegetation, or providing acoustical design techniques. Barriers have become the most popular choice. Since

1991 in Fairfax County, they consist of a solid wall of absorptive concrete that breaks the line of sight between vehicles and homes. Although noise barriers have a maximum decibel reduction of 20 dBA, most only provide 10-12 decibel reductions.

2. State Policy

Virginia adopted its original noise abatement policy in 1989. The policy established criteria for providing noise protection in conjunction with proposed highway projects in the State. Implementation of the policy has aided in the construction, or construction approval, of more than 100 federally-funded sound barriers. Experience with this policy created considerable feedback from citizens and elected officials. As a result, the Commonwealth Transportation Board decided to evaluate the policy for possible changes. The major source of information used was a survey of 15 State DOTs in the eastern U.S. The culmination of this process was the adoption of changes to the State policy in November, 1996 which became effective in January, 1997.

The key changes to the policy were to: 1) raise the cost-effectiveness ceiling from $20,000 per protected receptor to $30,000 per protected residential property based other state practices; 2) clarify that Virginia will not participate in any retrofit project along an existing highway when not in conjunction with an improvement for that highway; and 3) add the possibility for third party funding of the amount above VDOT's $30,000 ceiling if the abatement measure otherwise satisfies the criteria.

3. Noise Study Submission Guidelines

On July 24, 2000, the Board of Supervisors adopted Zoning Ordinance Amendment ZO 00-330, which permits noise barriers, in excess of the Zoning Ordinance fence/wall height limitations, to reduce adverse impacts of highway noise on properties adjacent to major thoroughfares, or to reduce adverse noise impacts of commercial and industrial uses on adjacent properties. Such barriers may be approved by the Board of Supervisors in conjunction with the approval of a proffered rezoning for any zoning district, including P districts, or in conjunction with the approval of a special exception application, or by the Board of Zoning Appeals as a special permit use. Pursuant to Par. 1 of Sect. 8-919 or Par. 3F of Sect. 10-104 of the Zoning Ordinance, a noise impact study is required to demonstrate the need for the noise barrier and the proposed height and level of mitigation to be achieved by the noise barrier. In conjunction with the adoption of this Zoning Ordinance Amendment, the Planning Commission and Board of Supervisors requested staff to develop standardized noise study submission guidelines, which would be submitted to the Planning Commission for review and comment prior to implementation.

In response to this request, a noise study submission form and guidelines were developed. This form requires the applicant to provide information regarding the assumptions and data used in the noise study, the results of the analysis and a detailed description of the visual impacts of the noise barrier and its effectiveness in providing noise mitigation. Given that the cost of providing this information may be prohibitive

for a noise barrier request on an individual residential lot, a second form has been developed which requires less information for noise barrier requests on individual residential properties.

Staff from the Department of Planning and Zoning, Department of Transportation and the Virginia Department of Transportation participated in the review and development of these guidelines. In addition, acoustical engineers from several acoustical consulting firms that have submitted noise studies to the County in the past were invited to provide written comments on two occasions; representatives from one consulting firm met with staff to discuss their issues and concerns regarding the proposed noise study submission guidelines. In addition, the guidelines have been transmitted to the Northern Virginia Building Industry Association (NVBIA) and the National Association of Industrial and Office Properties (NAIOP), by letter dated December 5, 2001, for their review and comment; however, no comments were received from these organizations. All comments and concerns received during this coordination were taken into consideration, and the noise study submission guidelines revised accordingly.

On March 14, 2002, the Planning Commission Environment Committee reviewed and endorsed the Noise Study Submission Guidelines. On March 20, 2002, the Planning Commission endorsed the guidelines.

On April 29, 2002, the Board of Supervisors accepted the proposed guidelines without change.

4. State Projects in Fairfax County

VDOT's Northern Virginia Office constructed the following sound barriers in FY 01-02:

- Widening of Route 123 to 4-lanes at Lee Chapel Road to Davis Drive
- Widening of Route 1 from Lorton to Telegraph Road
- Springfield Interchange sound barriers, under various phases of construction

The following barriers have been approved and construction is anticipated to begin on them in FY 01-02:

- Capitol Beltway at West Langley Subdivision in Fairfax County
- All County-funded work on the Fairfax County Parkway noise barriers has been completed. All future work on noise barriers will be through the Virginia Department of Transportation.

H. RECOMMENDATIONS

1. The Fairfax County Executive and his staff should continue to monitor the development of the EIS for the Airspace Redesign beyond the draft phase, monitor the docket resulting from public comments, revisions to the current version, etc. for developments and considerations raised by others that might, if fixed, impose impacts on our air space and environment.

2. The Fairfax County Executive and his staff should continue to monitor the MWAA quarterly reports and statistics to monitor trends associated with complaints, violations, and civil penalties. With the data base, the County Executive and his staff will be better positioned to intercede for residents should trends reflect a major shift or increase in noise levels and complaints.

VII-2. LIGHT POLLUTION

A. OVERVIEW

Light pollution is a general term used to describe light output primarily from exterior (outdoor) sources in commercial, residential, and roadway settings that is excessive in amount and/or that causes harmful glare to be directed into the path of travel or into residential neighborhoods. Light pollution is thus both a safety issue and a quality of life issue. With the increasing urbanization of Fairfax County, exterior (outdoor) lighting and light pollution in its many forms have become pressing issues to our communities. At present, Fairfax County has some regulations regarding exterior lighting, but they are minimal and out of date, since they do not take into account the numerous major advances that have been made in lighting technology in recent years.

The County staff has been working on a revision of the lighting ordinance for more than two years, and, shortly before this report went to press, released a proposed draft of a revision. In EQAC's opinion, this draft is significantly flawed in a number of respects and inadequate in the comprehensiveness with which it addresses a number of problem areas. Therefore, in EQAC's opinion, it will require substantial modification and expansion to make it an acceptable ordinance.

B. ISSUES AND PROBLEMS

The main issues and problems of exterior lighting and light pollution may be summarized as follows:

1. Glare

Glare, as defined by the Illuminating Engineering Society of North America (IESNA), falls into three main categories:

a. Disability glare – Disability glare, also known as veiling luminance, is caused by light sources that shine directly into ones eyes and is dangerous because it is blinding.

b. Discomfort glare – Discomfort glare does not necessarily reduce the ability to see an object, but it produces a sensation of discomfort due to high contrast or non-uniform distribution of light in the field of view.

c. Nuisance or annoyance glare – Nuisance glare is that which causes complaints such as, "The light is shining in my window."

Glare is a significant and pervasive problem that seriously impairs both safety and quality of life. Glare demands attention in that one's eyes are naturally attracted to bright light, and at night this destroys the eye's dark adaptation, which is a serious driving hazard. Obtrusive lighting by commercial establishments to attract attention is a serious problem as is selection of inappropriate fixtures for exterior residential lighting. Glare and excessive illumination cast into surrounding residential neighborhoods not only detracts from the quality of life but can make it difficult for pedestrians and homeowners to see their surroundings.

2. Light Trespass

Light-trespass is the poor control of outdoor lighting such that it crosses property lines and detracts from the property value and quality of life of those whose property is so invaded. It is particularly common when obtrusive commercial lighting is immediately adjacent to residential neighborhoods or when a homeowner uses inappropriate fixtures, light levels, and lighting duration, often in the interest of "security." It is generally categorized in two forms:

a. Adjacent property is illuminated by unwanted light.

b. Excessive brightness occurs in the normal field of view.

Both of these forms may be present in a given situation.

3. Security

Much outdoor lighting is used in the interest of providing security. These safety concerns often result in bad lighting rather than real security. One reason often cited for today's bright lights is that high wattage is needed to deter crime. If light is overly bright with excessive glare it makes it easier for a person to hide in the deep shadows created by objects in the harsh glaring light. This might actually encourage crime rather than discouraging it. The debate as to whether or not additional light provides more safety has been more emotional than factual. The few rigorous studies that have been done reveal no connection between higher lighting levels and lower crime rates. This may be due to people with nefarious intent taking more risks in better lit areas. For example, the National Institute of Law Enforcement and Criminal Justice found no statistically significant evidence that lighting impacts the level of crime (Upgren, 1996). Thus, the supposed correlation between a high level of security lighting and reduced crime appears to be nothing more than a popular myth.

4. Urban Sky Glow

Urban sky glow is brightening of the night sky due to manmade lighting that passes upward with the light rays reflected off of submicroscopic dust and water particles in the atmosphere. Although urban sky glow was first noted as a problem by the astronomical community, it is by no means any longer an astronomical issue. With the

increasing urbanization of many areas of the U.S., all citizens in those areas are now being affected. In Fairfax County, which is now an urban county, improper lighting has seriously degraded the darkness of our local night skies into a pallid luminescence that many of our citizens find objectionable.

5. Energy Usage

Smart lighting techniques, which direct all of the light generated onto the target area, reduce energy consumption and hence the use of fossil fuels. Several engineering estimates suggest that at least 30 percent of outdoor lighting is being wasted through spilling upward and outward rather than being directed downward onto the target area. Also, many installations are greatly over-illuminated as well as being lighted for unnecessary durations, further compounding the energy wastage. Inefficient lighting incurs both direct financial costs and hidden environmental costs. It has been estimated by national organizations studying light pollution that in excess of $8 billion of electricity is being wasted annually on obtrusive and inefficient outdoor lighting (see data from Virginia Outdoor Lighting Task Force and the International Dark-Sky Association). Since electricity generation in the eastern part of this country is mostly from fossil fuels, every unnecessary kilowatt of electrical energy generated also produces unnecessary greenhouse gases and acid rain.

C. CURRENT COUNTY STANDARDS AND REGULATIONS

In EQAC's view, Fairfax County currently has a minimal ordinance that does prescribe limits for the maximum wattage of light sources and for the amount of glare in residential districts. However, these standards do not cover all roadways (particularly main roadways, which are under the jurisdiction of the Virginia Department of Transportation (VDOT)) nor is there any policy regarding residential street lighting. Additionally, the combined effects of glare into residential neighborhoods from sources such as park lights and lights on nearby commercial buildings are not fully addressed.

Fairfax County's *Policy Plan: The Countywide Policy Element of the Comprehensive Plan* (2000 Edition) recognizes the nuisance of light emissions arising from increasing urbanization and recommends that efforts be made to avoid creating sources of glare that interfere with residents' and/or travelers' visual acuity. To put this into practice, the current County Zoning Ordinance lists glare standards. Specifically, it requires that illumination shall not produce glare in residential districts in excess of 0.5 foot candles and that flickering or bright sources of light shall avoid being a nuisance in residential districts. It also prescribes limits for the maximum intensity of light sources as follows:

SOURCE	INTENSITY	
	Group I	Group II
Bare incandescent bulbs	15 watts	40 watts
Illuminated buildings	15 foot candles	30 foot candles
Back lighted or luminous background signs	150 foot lamberts	250 foot lamberts

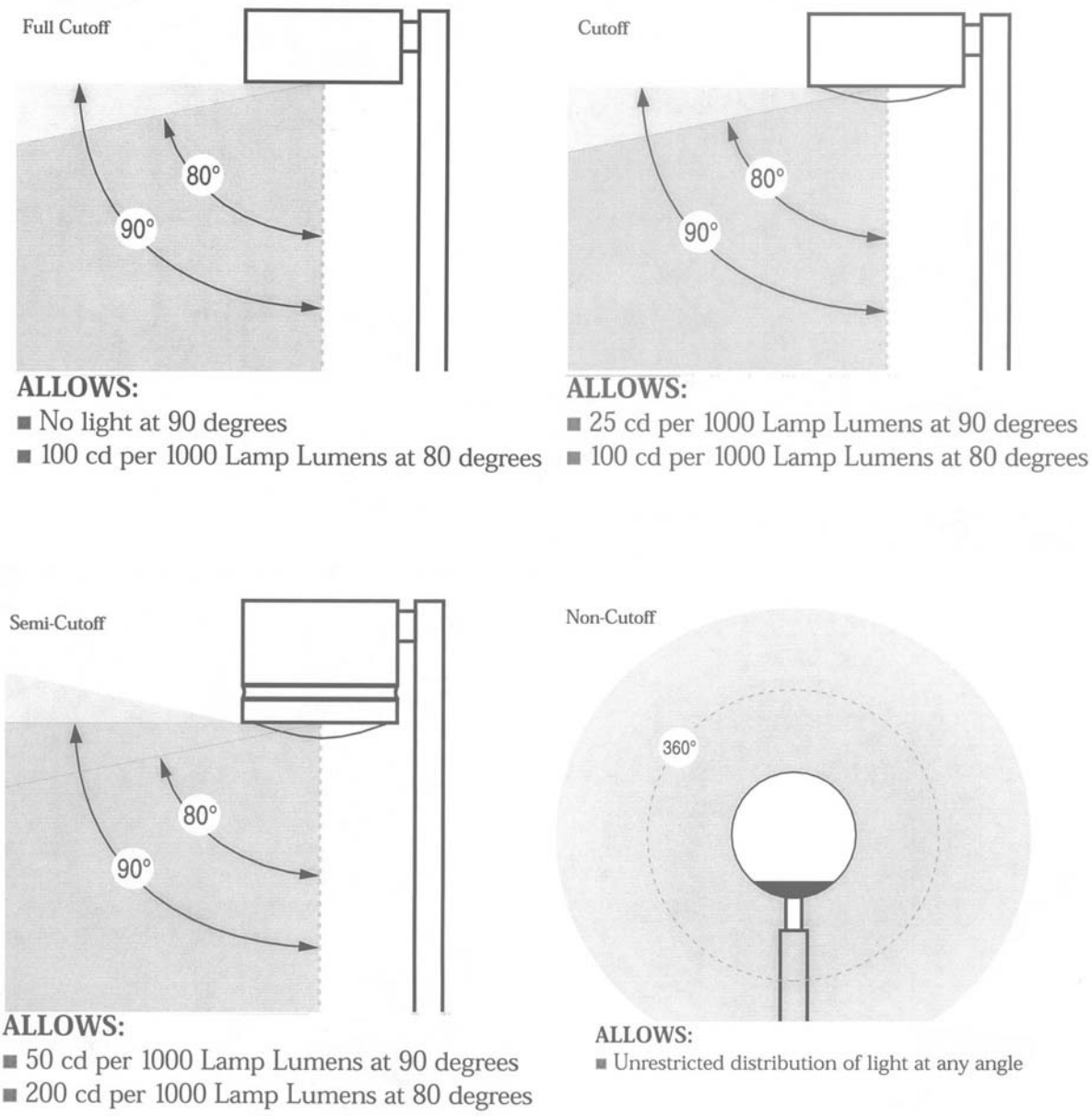
Group I applies to all residential zoning as well as commercial districts 1 through 4 and industrial districts 1 through 4. Group II is limited to commercial districts 5 through 8 and industrial districts 5 and 6.

D. ADDRESSING THE PROBLEM

One of the most common street lights in use, the cobra-head fixture, draws 150 watts. A fixture with reflective backing and shielding can direct all light below the horizontal plane with the same illumination of streets and homes and use only 100 watts. The same possibility exists with the popular 175 watt unshielded mercury vapor lamp. Both the 150-watt cobra-head fixture and the 175-watt mercury vapor lamp cast light laterally as well as down. As a result, substantial glare is often cast directly into the eyes of drivers. This glare destroys drivers' dark adaptation, creating potential safety hazards. In many cases the driver is not able to see the roadway any better than he or she would with lower-wattage properly shielded lights, and in many cases his or her vision is much worse. Because they cut down on glare, shielded fixtures not only are safer for drivers, but according to experts (see references) actually make it easier for pedestrians and home owners to see their surroundings.

By redirecting this wasted energy, lower wattage lights provide the same amount of illumination in the areas where it is needed. These fixtures have reflective backing and full cut-off shielding to direct all light below the horizontal plane, with 90 percent of the light directed below an angle of 20 degrees from the horizontal. For example, a 50-watt metal halide lamp with a reflective shield will provide as much illumination below the horizontal plane as the 150-watt cobra-head fixture or the 175-watt unshielded mercury vapor lamp. These newer types of fixtures, which are recommended by the Illuminating Engineering Society of North America, are widely available and direct all light below the horizontal plane, thereby eliminating lateral glare (see Figure VII-2-1). It is estimated that it takes only three years of energy savings to recoup the initial investment in these fixtures. The lower wattage fixtures provide energy savings, improved driver safety, better visibility for pedestrians, and an improved ambiance and security for neighborhoods. Several municipalities, such as Tuscon, San Diego, and Sanibel Island, Florida, have adopted street lighting ordinances requiring these newer fixtures.

Figure VII-2-1
Effects of Cut-off and Non Cut-off Luminaires



(Sources: Paulin, Douglas, *Full Cutoff Lighting: The Benefits*, IESNA website, and Shaflik, Carl, *Environmental Effects of Roadway Lighting*, Information Sheet Number 125, International Dark-Sky Association, Tucson, Arizona, August 1997.)

Most security lighting is overdone, with high wattage lights burning from sundown to sunup. As noted earlier, constant levels of illumination tend to be largely ignored because they are commonplace, and they waste a huge amount of energy. The large amount of glare produced by high intensity sources creates shadows that provide hiding places for intruders. Moreover, the constant glare and light trespass onto adjacent properties is a major source of annoyance to their occupants. On the other hand, lights that are activated by motion within a controlled area attract immediate attention and, at the same time, use very little energy and create intrusion on adjacent properties only when such attention is desired. For example, if one is using 300 watts of security lighting for 10 hours each night and converts to an infrared motion sensor control that turns on the lights only when there is motion in the controlled area, energy cost is reduced to almost nil. In addition, the cost of the added sensor-control hardware itself can be recovered in as little as two months due to the energy saving. At the same time security is increased rather than decreased, and glare and light trespass onto adjacent properties is virtually eliminated.

Glare is a significant and pervasive problem, but one that is easily solved by installing fully shielded light fixtures. Where it is not possible to completely eliminate glare through the use of shielded fixtures, motion detector controls can limit the harsh light to only a minute or two when it is really needed.

Light-trespass is a term of relatively recent origin and denotes (1) glare that is generated by sources on one property that lie within the normal field of view of the occupants of another property, and (2) light that spills over the boundries of one property onto another, thereby producing unwanted illumination of it. Increasingly, such light intrusions are being regarded as trespass violations every bit as serious as physical trespass of a person onto the property of another. Such problems can now be readily avoided by the selection of proper fixtures, intensity levels, and the use of timers and sensors/controllers. This is an area where a comprehensive and robust revised County ordinance is badly needed.

Sky-glow is also readily addressed by the selection of properly designed modern fixtures for new installations and phased retrofit of current inadequate installations. The cost of such retrofits is normally recoverable within a reasonable time period (usually estimated at about three years) through efficiently placing all of the light onto the desired area and the lower energy usage.

Adherence to the following four principles will do much to mitigate or eliminate light pollution.

a. Always illuminate with properly shielded fixtures that prevent the light source itself, and the resultant glare, from being directly visible. This is done by using cutoff fixtures or supplementary shielding that keeps all of the illumination below the horizontal plane and directed onto the target area.

b. Do not over-illuminate. Never use more illumination than needed for the task at hand. Using a 400 watt floodlight to illuminate a small parking area or a flag at

night is overkill and wastes a great deal of energy. A properly shielded and adjusted 250 watt luminaire (light source + fixture) can illuminate an area just as effectively as an older style 1,000 watt light source.

c. Always aim lighting downward, keeping all of its distribution within the property lines and below the horizontal plane so that it is not a source of glare. Light trespass onto adjacent properties is unnecessary, inconsiderate, and potentially illegal.

d. Do not burn lighting all night long with the intention of improving security. Using infrared motion sensor-controlled lighting that comes on instantly when there is motion in the designated area is far more effective as a security measure. That rapid change from dark to light draws the immediate attention of everyone in the surrounding area, including security and law enforcement personnel on patrol, and may well be unsettling enough to cause illicit intruders to immediately flee. Lighting that stays on all night draws no special attention and is an enormous waste of energy.

E. PUBLIC AGENCY RESPONSIBILITIES

Compliance with glare standards for residences and other private property is the responsibility of the County's zoning enforcement staff. The County has 18 zoning inspectors (two per magisterial district) to oversee all Zoning Ordinance enforcement. Any enforcement activity dealing with light is complaint-driven. During 1997, the staff received 11 light-related complaints out of a total of 2,287 complaints. The County does not respond to anonymous complaints. Complaints are either filed directly with the Zoning Enforcement Branch or are forwarded by the staff of a member of the Board of Supervisors. The causes of the complaints were usually fast food establishments, security lighting for residences, athletic facilities (e.g., ball fields, driving ranges), or churches. The zoning inspectors typically resolve violations with informal enforcement such as a verbal warning that there is a violation and how it may be remedied. A written notice of violation or civil action can be used if needed. Beyond the general glare standards, the County frequently has been able to impose additional restrictions through the provisions of the rezoning, special permit and special exception processes. However, it is clear to EQAC that that a revised ordinance must set standards and regulation for all types of uses and development within the County, including single family residential and by-right development.

One of the most onerous sources of light pollution is the obtrusive lighting of commercial and industrial facilities, particularly commercial retail and service establishments. While their desire to attract attention to themselves is understandable, abusive excesses degrade the overall ambience of our commercial areas and materially degrade the quality of life in adjacent residential neighborhoods. In EQAC's view, this is exacerbated by the current absence of a comprehensive and carefully drawn ordinance, especially in the areas of glare and light-trespass onto the properties of others. It is of particular concern in the case of

"by-right" development where there are no public hearings (e.g., Planning Commission, Board of Zoning Appeals, Board of Supervisors) at which adjacent property owners and neighborhoods can register their concerns and see approval conditioned on appropriate restrictions. In such "by-right" cases, the initial responsibility would necessarily fall almost entirely upon the Office of Building Code Services of the Department of Public Works and Environmental Services, which reviews all proposed plans before a building permit is issued and subsequently conducts inspections to ensure that the work is in compliance with regulations. Evaluation of plans for compliance would add a small amount of effort to the review process but would add only a negligible amount to the inspection process.

At this time the County has no formal policies regarding street lighting. Some neighborhoods within the County prefer street lighting, while others do not. Whether or not the County provides street lighting is often driven by budget priorities, and, unless there is a demonstrable public safety need, the priority for retrofitting an established community is usually low. More often, street lighting is addressed in the overall planning of new subdivisions. In these cases, the Office of Site Development Services would have responsibilities for both reviewing the plan and inspecting the implementation of it.

Responsibility for the lighting of main roadways is under the jurisdiction of VDOT. Historically, local communities and neighborhoods have had to deal directly with VDOT over roadway lighting issues. It has proven very difficult to influence VDOT's choice of fixtures and technical standards, even when it can be demonstrated that their proposed implementations will result in unacceptable levels of glare and light trespass in adjacent residential neighborhoods. However, in the past year significant headway has been made in getting VDOT to recognize the severity of the problem and to take some limited first steps to address it. Recently, Fairfax County won a case against VDOT in the Virginia Supreme Court over whether VDOT had to consider County zoning regulations in its placement of monopole communication towers in VDOT rights-of-way within the County. For some time VDOT has been developing plans for extensive lighting of the Virginia portion of the Capitol Beltway from the Wilson Bridge to the Cabin John Bridge without regard to the impact on dozens of adjacent neighborhoods and thousands of our citizens. Perhaps a similar determination should be sought as to whether the County can limit VDOT's options for luminaries (lamp+fixture) to be used for roadway lighting on VDOT maintained roadways within the County and even whether such lighting is needed at all.

It should be noted that the Department of Planning and Zoning has been reviewing a number of the things discussed and recommended in this report for approximately the past two and one-half years, and during this period has been drafting revisions to the present very limited ordinance. However, shortly before this report went to press, the draft ordinance was released for preliminary review. It is EQAC's opinion that the proposed revision is neither sufficiently comprehensive nor adequately robust and will require major enhancement and modification at the staff, Planning Commission, and Board of Supervisors levels in order to have credibility and gain acceptance.

F. PUBLIC EDUCATION AND AWARENESS NEEDS

The general public needs to be made aware of the sources and problems of light pollution and of the methods by which these can be best addressed. This can be done in two ways. First, an informative brochure should be prepared that can be made available to individuals, homeowners groups, and community associations. Brochures could be made available through appropriate County offices and through the district offices of the members of the Board of Supervisors. Even more effective would be to make the information available through the County's web site, which has become an exemplary vehicle for distributing the latest information relating to all aspects of County governance and services.

A few jurisdictions in other areas have prepared technical brochures and bulletins to familiarize architects, contractors, and electricians with their lighting codes and to specifically describe what their jurisdictions do not permit (e.g., unshielded security lights, angle-directed post or building mounted fixtures, wall packs without shielding or baffling, excessive wattage or unshielded floodlights, light-trespass onto other properties, etc.) and what they recommend. Fairfax County should prepare a brochure of this type to coincide with the introduction of a new ordinance so that the development, contractor, and building management communities will be fully aware from the outset of the revised standards and how best to address them.

There is an excellent website (**http://www.qualityoutdoorlighting.com**) that illustrates many examples of good, bad, and ill-conceived lighting practices right here in our local area. It can play a central role in education of the public.

G. CONCLUSIONS

The principal means to prevent poor exterior lighting practices is a comprehensive code or ordinance, because this provides an enforceable legal restriction on specific lighting practices that are deemed unacceptable to the community and its quality of life. Numerous jurisdictions have adopted codes and ordinances that have proven very effective in reducing light pollution and preventing light trespass. A properly conceived and well written code will permit all forms of necessary illumination at reasonable intensities, but will require shielding and other measures to prevent light pollution and light trespass. A good code will apply to all forms of outdoor lighting, including streets, highways, and exterior signs, as well as lighting on dwellings, commercial and industrial buildings, parking areas, and construction sites. A good code will also provide for reasonable exceptions for special uses within acceptable time periods and subject to effective standards. In EQAC's opinion, the current County code is outdated and inadequate, and the initial draft of a revision is also inadequate and significantly flawed.

The County needs to work closely with VDOT to achieve better lighting practices on roadways within Fairfax County that are under VDOT jurisdiction. Current VDOT

lighting and proposed new installations are regarded as being very intrusive by adjacent neighborhoods. However, it should be noted that a newly enacted law requiring the Commonwealth to acquire only shielded fixtures should materially improve VDOT practices in this regard. In addition, consideration should be given to seeking a legal determination as to whether VDOT can be constrained by County ordinances.

Much of the security lighting, both residential and commercial, in Fairfax County is poorly conceived, excessive in intensity, and improperly directed and controlled. These deficiencies could be corrected at relatively low initial costs that would be rapidly recovered through the energy savings realized.

Much lighting in residential neighborhoods uses old style fixtures that cause light trespass onto adjacent properties. A new comprehensive code and public awareness campaign must address correction of these problems. Under no circumstances should single family dwellings be exempted from any of the provisions of a revised code, for that is where the majority of us live and where our quality of life is most affected by intrusive lighting.

Poor lighting design, particularly in commercial areas, is contributing to excessive and highly objectionable sky-glow. A new code and retrofitting or adjustment of fixtures could eliminate the worst of this effect.

H. RECOMMENDATIONS

1. EQAC recommends that the Board of Supervisors direct the Department of Planning and Zoning to immediately correct the deficiencies in the draft revised ordinance to properly and adequately address lighting standards and practices in Fairfax County and the problems of light pollution and to use the input of suitably qualified outside assistance to achieve this.

2. EQAC recommends that the Board of Supervisors direct that all future exterior lighting fixtures installed on Fairfax County facilities and properties follow the recommendation of the Illuminating Engineering Society of North America that most lighting fixtures be fully shielded and direct all light below the horizontal plane.

3. EQAC recommends that the Board of Supervisors direct that all older lighting fixtures under County control that do not meet the above standard be replaced on a phased basis with these newer recommended fixtures. EQAC notes that these steps will lead to significantly lower energy costs that will recoup the costs of the changeover in a reasonable period of time.

4. EQAC recommends that the Board of Supervisors work with VDOT and Virginia elected officials to achieve replacement of existing poorly designed fixtures on our roadways (under the control of VDOT) with the same type of fixtures recommended in Recommendation 3 above.

5. EQAC recommends that the Board of Supervisors direct the County Attorney to evaluate the feasibility of seeking a legal determination at the Virginia Supreme Court level (using the monopole decision as precedent) of whether VDOT can be required to consider a County outdoor lighting ordinance in planning and implementing roadway lighting within the County.

6. EQAC recommends that the Board of Supervisors direct the County staff to prepare both a printed brochure and an item on the County web site to promote public awareness of issues, problems, and solutions connected with illumination and light pollution. EQAC further recommends that the Board of Supervisors direct that a technical brochure be prepared for the education of architects, contractors, electricians, and builders as to what the County permits and does not permit in the field of illumination. Both of the above items should be made available at the time a comprehensive illumination ordinance is adopted by the Board.

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Some Lighting Myths, Information Sheet Number 42, International Dark-Sky Association, Tucson, Arizona, January 1991.

Fairfax County, Virginia, *Policy Plan: The Countywide Policy Element of the Comprehensive Plan*, 2000 Edition.

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Illuminating Engineering Society of North America web site, http://www.iesna.org/. (There are numerous subsidiary and related web sites

International Dark-Sky Association web site, http://www.darksky.org/

National Electrical Manufacturers Association website, http://www.nema.org/. (Particularly see their White Paper on Outdoor Lighting Code Issues.)

Virginia Outdoor Lighting Taskforce (VOLT) web site, http://www.volt.org/ .

Quality Outdoor Lighting website, http://www.qualityoutdoorlighting.com/ .

VII-3. URBAN POLLUTION: VISUAL BLIGHT

"Pollution is the contamination of the environment as a result of human activities."

A. OVERVIEW

The term pollution refers primarily to the fouling of air, water, and land by wastes. In recent years it has come to signify a wider range of disruptions to environmental quality. Thus litter, billboards, and auto junkyards are said to constitute visual pollution. Light and noise are also pollutants in urban and suburban areas -- Over the last one hundred years, the increase of artificial light reflected from city streets and buildings has eroded our ability to see the night sky. Scientists say nearly two-thirds of the United States population can no longer see the Milky Way[2]. With respect to noise, noise excessive enough to cause psychological or physical damage is considered noise pollution. Both noise pollution and light pollution issues have been addressed earlier in this chapter. This section of the chapter focuses, therefore, on visual blight/pollution issues.

During the 1960s, 1970s and early 1980s, visual blight problems were generally attributed to air pollution and its effects on the ability to view and appreciate the beauty of scenic vistas and national parks. Smog, brown-cloud, haze and other atmospheric aberrations caused a public outcry followed by activity by the Federal Government. Webster's defines "blight" as -- 1: a disease or injury of plants resulting in withering, cessation of growth, and death of parts without rotting by an organism that causes blight; 2: something that frustrates plans or hopes; 3: something that impairs or destroys; 4: a deteriorated condition (urban blight). Certainly, definitions 2 through 4 characterize the emotions that the general public must have felt when after long trips, the beauty of the national park vistas and parks was impeded because of atmospheric conditions.

In more recent times, urban visual blight has morphed to include a wide range of reality of many communities. Fairfax County is not precluded from many of modern-day urban visual blight. In this report, we are equating "blight" and "pollution" as having generally the same definition. Pollution frustrates plans or hopes, it does impair or destroy life forms, and it is certainly representative of a deteriorated condition. Thus, brownfields, billboards, lighting that impairs our ability to enjoy astronomical observations, exhaust fumes from mobile sources, trash and litter on roadsides, unkempt properties, above-ground power and video transmission lines, political advertising, other forms of extraneous and non-professional advertising, are classified today as urban blight, or visual pollution. As noted earlier, lighting issues have been dealt with elsewhere in this chapter and are therefore not addressed within this section of the report. Air quality issues, as they relate to local compliance with Federal standards, are also addressed elsewhere in this report. With respect to brownfields, billboards, and transmission lines, EQAC will be studying these

[2] **Tim Bauer,** Park Supervisor, Lake Hudson Recreation Area in Michigan

issues further to determine their applicability to Fairfax County; however, these topics will not be addressed further in this year's *Annual Report*.

B. SIGNAGE

Fairfax County developed and promulgated an ordinance to deal with signage, **Fairfax County Zoning Ordinance (Chapter 112 of the *Fairfax County Code*), Article 12, Signs**. It basically deals with permitted and non-permitted signage (e.g., what kind of sign needs a permit versus that signage not requiring a permit). For example, the Ordinance states when political or other signage that is temporary in nature must be removed, etc. The Ordinance appears to cover the subject thoroughly, but that facts would suggest that enforcement is lacking, or the bureaucracy is not organized in a way that would ensure cost effective enforcement.

On September 10, 2001, the Fairfax County Sign Task Force issued their report titled, *"Illegal Signs in the Right of Way."* The Board of Supervisors initiated formation of the Task Force in August of 2000 to:

- Examine current practices and enforcement procedures regarding signs within and along the roadways;
- Investigate other jurisdictions' best practices in dealing with illegal signs (pursuant to Article 12);
- Recommend or suggest legislative or amendments to the County's sign ordinance.

Illegal signs in the public rights-of-way have been around for as long as there have been public rights-of-way, but the numbers have spiraled out of control in recent years. Between fields of "popsicle-stick" signs for homebuilders and politicians, and signs for weight loss, work-at-home businesses, hauling, and other signs plastered on every available traffic sign and utility pole, everyone in Fairfax County has something to hate about illegal signs.

As noted above, the Task Force concluded that there is no one agency within the County government that is devoted to removing those signs or prosecuting persons who erect the signs in violation of the law. The Task Force concluded that cleanup efforts are inadequate unless a County official receives complaints or unless the VDOT receives complaints. Therefore, it appears that what little effort there is to remove signs is responsive rather than proactive. Some neighboring communities assign specific persons to this job, but Fairfax County does not have such a system. In fact, Zoning Inspectors do have authority delegated to them from VDOT to remove illegal signs. However, on many occasions when County inspectors have removed signs; e.g, on a Friday evening, they are back up by Monday morning or sooner. Good citizens attempting to help the County by removing signs themselves are not authorized to do so; therefore, they are inviting a liability when they do remove signs.

The Task Force made several recommendations. We urge the Board of Supervisors to consider their report and either implement their findings or reconstitute the Task Force to find alternatives that are more palatable to the Board and citizens of the County.

- After holding a public hearing, the Board, pursuant to Virginia Code §33.1-375, should enter into an Agreement with the Commissioner of VDOT to enforce Virginia Code § 33.1-373. The Agreement would provide for sharing civil penalties collected after the County's costs have been recovered. [The Task Force provided a draft Agreement for the Board to consider.]

- The County should support the County Sheriff's program of using inmates for removal of roadside litter including removal of signs illegally posted in a right-of-way.

- Implement a pilot project of approximately 6 months to determine whether additional resources are needed, and if so, develop a list of alternatives for further evaluation and ranking in terms of cost benefit analysis for the Board to use as they decide whether to expand the Agreement or move into a different direction.

- Conduct a publicity, public outreach program, with the assistance of consulting experts in this field regarding restrictions of signs in the public rights-of-way and any new County program to prosecute sign violations.

- The County Executive should send letters to public entities within the County advising them of illegal signs and outcomes of posting same.

- The Board should invite VDOT to consider implementing in Fairfax County possible deterrents to minimize illegal signs in the rights-of-way.

The Task Force also proposed legislative changes such as:

- Seek an amendment to the Code of Virginia that would declare all signs illegally posted in a right-of-way to be abandoned or trashed may be removed by anyone.

- If not successful or possible, then the alternative is to seek an Amendment of the Code of Virginia that would permit individuals that participate in the Adopt-A-Highway program to remove or cleanup illegal signs as duly authorized representatives of the Commissioner.

- Seek an Amendment to the Code to address whether political campaign signs are subject to the restrictions on advertisements in the right-of-way. If so, then the County should consider offering recommendations that might limit the number, minimum distance between individual signs and time frame for posting and then removing the signs.

- Seek an Amendment to the Code to increase civil penalties the $100 Civil Penalty.

C. RECOMMENDATION

The recommendation provided below addresses only the third section of this chapter (Urban Pollution: Visual Blight). Recommendations addressing noise and light pollution are found beginning on pages VII-9 and VII-20, respectively.

1. The Environmental Quality Advisory Council supports the recommendations made by the Fairfax County Sign Task Force and recommends that the Board of Supervisors implement these recommendations.

CHAPTER VIII

THE INTERRELATIONSHIP OF LAND USE AND TRANSPORTATION

VIII. THE INTERRELATIONSHIP OF LAND USE AND TRANSPORTATION

A. ISSUES AND OVERVIEW

The linkage between land use and transportation is similar to the chicken and the egg – which comes first? While there is no real answer, there needs to be coordination during the planning phase, as well as infrastructure development. What comes first should not be the debate; rather, the discussion should acknowledge the interdependency between land use and transportation and should seek ways to integrate them into a comprehensive plan. Air quality and water quality are also ultimately tied to land use patterns in Fairfax County. An increase in impervious surface generated by development contributes to stream degradation. Patterns of development that contribute to increased automobile use and that do not favor transit contribute to degraded air quality.

We tend to deal with mobility and livability as separate, often competing, concepts. While we have institutionalized measures of traffic congestion (volume-to-capacity, average travel speed, and vehicle hours of delay), we have too often ignored measures of livability and community character – those factors that determine the quality of the places we are striving to reach so quickly. A growing number of communities, including Fairfax County, are attempting to fundamentally change the process so that land use and transportation are better linked, bringing the concepts of mobility and livable communities into a single focus. With efforts to create pedestrian- and transit-friendly streets, redevelop old shopping malls into mixed-use walkable town centers, and encourage infill residential development, communities of all sizes are beginning to consider transportation and land use as part of an interrelated system in which mobility and livability are in balance.

There is also a recognition that the old solutions to transportation issues, primarily emphasizing road construction and placing little emphasis on transit, have not worked. A recent report by the Surface Transportation Policy Project (STPP) found that increasing road capacity leads to increased traffic loads. STPP found that every ten percent (10%) increase in the highway network results in a five point three percent (5.3%) increase in the amount of driving, *over and above any increase caused by population growth or other factors*. The analysis concludes the road building has not been an effective congestion-fighting measure. In fact, STPP found that those metropolitan areas that added the most highway space per person saw congestion levels rise at a slightly higher rate than areas that added few roads.

County residents are well aware of the length of time it takes to travel in and around the County. The transportation crisis in Northern Virginia will never be solved until we reduce our excessive reliance upon the automobile and, in particular, single occupant vehicle use. One method used to decrease the amount of traffic in an area is to promote the concentration of residential and commercial mixed use development along "transportation"

corridors, particularly around transit stations. This planning objective is being implemented in several areas of Fairfax County, including the Tysons Corner, Dulles Corridor and Merrifield areas.

While the interrelationship of land use and transportation seems obvious, a less obvious and probably substantially more controversial issue concerns the methods that should be employed to make land use and transportation decisions that are compatible and lead to improved quality of life in our community. The Transportation Coordinating Council ("TCC") of Northern Virginia, an advisory group of locally elected officials, was charged with recommending regional transportation priorities and funding allocations. In December 1999, the TCC adopted the Northern Virginia 2020 Transportation Plan. One of the guiding principles identified by the TCC in developing the 2020 Plan was to improve the link between transportation and land use. In its resolution that adopted the 2020 Plan, the TCC agreed to "create a subcommittee to review the interdependence of transportation and land use and recommend guidelines for implementing 2020 Plan improvements". That effort led to the preparation of the Alternative Transportation and Land Use Strategies (ATLAS) Study. While the ATLAS study was never formally adopted by the TCC, EQAC feels that the recommendations contained in the study provide an excellent set of guidelines for evaluating land use and transportation issues. Those guidelines that are particularly relevant and potentially very useful in Northern Virginia are discussed in Section B of this chapter. The reader will recognize that many of them have already been utilized in some form in Fairfax County.

As previously mentioned, the Fairfax County Board of Supervisors has recognized the interrelationship of land use and transportation. As identified and discussed in Section C, the County's Comprehensive Plan incorporates numerous overall goals, objectives and policies that attempt to effectively balance land use and transportation. Because the focus of this part of the Report is on the interrelationship of land use and transportation, many other important elements of the Comprehensive Plan that are intended to make communities more livable and compatible with the environment are outside the scope of this discussion.

Section D discusses aspects of the Comprehensive Plan for three specific areas of the County that demonstrate how land use and transportation planning concepts have been applied to plan what we hope will be livable communities that maximize the benefits of transit and substantially reduce the congestion. The areas discussed in this section include the Tysons Corner Urban Center, the Reston-Herndon Area Suburban Center and Transit Station Areas and the Merrifield Suburban Center.

Obviously, it is important to include worthy goals, objectives and policies in the Comprehensive Plan; however, they must be implemented if they are going to make a difference. Section E contains a discussion of the Dulles Corridor Rapid Transit Project, a project that, if properly implemented, could dramatically contribute to the achievement of the goals established for the Tysons Corner Urban Center and the Reston-Herndon Area Suburban Center and Transit Station Areas. Section E also contains a brief discussion of the Northern Virginia Transportation Authority and the potential that Authority has to bring a regional perspective to the interrelationship of transportation and land use issues.

Finally, Section F contains recommendations relative to land use and transportation, particularly as to how the interrelationship of land use and transportation can be used to create less congested and more livable communities.

EQAC's concerns about air quality are expressed in Chapter II of this report. Appropriate implementation of the County's policies and objectives relating to the interrelationship of land use and transportation, particularly the objective of emphasizing transit use and decreasing the dependence on automobiles, should also help improve air quality in the County. The reader should refer to Chapter II for a discussion of EQAC's concerns about air quality.

B. THE ALTERNATIVE TRANSPORTATION AND LAND USE ACTIVITY STRATEGIES STUDY

1. Introduction

As discussed in Section A, the ATLAS study identified several planning and development strategies that can be employed to better link land use and transportation policies. After the study was completed, a survey was submitted to the local jurisdictions to identify those strategies identified in ATLAS that could best meet the charge in the 2020 Plan resolution to establish guidelines for implementing planned transportation improvements. Section B-2, below, discusses the five ATLAS strategies that received the most support from the jurisdictional surveys, and how each of those strategies can be used to evaluate land use and transportation issues.

Many of the strategies identified in the ATLAS study did not make the "top 5 list". Section B-3 discusses additional strategies that were included in the ATLAS study and that, in the opinion of EQAC, should also be used in planning for the interrelationship between land use and transportation.

There are other worthy strategies identified in the ATLAS study. However, emphasizing the ten guidelines discussed herein will establish a good, if not fully comprehensive, approach to evaluating transportation and land use as part of an integrated system where mobility and livability are in balance. In Fairfax County, many of these strategies have already been used and are incorporated into the goals, objectives and policies of the Comprehensive Plan. Again, however, they will only aid in making good land use and transportation decisions if they are properly implemented and used on a regular and consistent basis.

2. ATLAS Strategies Receiving the Most Support by Local Jurisdictions

a. Comprehensive Plans

A comprehensive plan is an official public document adopted by a local governing body that is used as a policy guide to facilitate the orderly development of the community. The plan is developed by examining existing conditions and needs,

considering opportunities and alternatives, and adopting goals and objectives which, taken individually or collectively, will further the orderly development of the community. The Comprehensive Plan can be used as a fundamental tool to control the location of growth and determine transportation facilities.

b. Transit Oriented Development

Transit Oriented Development (TOD) is a combination of techniques designed to encourage the use of transit. Measures include increased densities, clustered development, pedestrian amenities, parking restrictions, and urban design enhancements. TOD promotes mixed use development in patterns directly accessible to transit stations and facilities. TOD strategies integrate land use development into transit facilities and have been shown to reduce single occupancy vehicle trips and to increase transit usage.

c. Location Efficient Development

Location Efficient Development consists of residential and commercial development intentionally located to have good access, including suitable walking and cycling facilities, transit services, and proximity to common services. In such locations, residents can often use alternative travel modes, and when they do drive, their trips tend to be short. These features reduce automobile ownership and use, which reduces vehicle and parking costs. This strategy can be used to support a variety of land use and transportation goals including enhancing the pedestrian environment and reducing regional vehicle miles traveled (VMT).

d. Jobs – Housing Balance Requirements

The concept of a jobs-housing balance attempts to maintain proportionate supply of housing compared to the jobs available in an area or locality. An effective jobs-housing balance implies that there is a degree of match between income levels of workers and costs of the available housing. Additionally, reductions in vehicle miles traveled may be achieved by encouraging closer proximity of housing and jobs that match in terms of similar income level and housing cost. Measures to stimulate such a jobs-housing balance are typically implemented through zoning restrictions. This strategy requires a balance of jobs and housing, incorporated by statute as opposed to being adopted as policy. Where implemented, this strategy promotes mixed use development, decreases total trip distances, and reduces vehicle miles traveled.

e. Bonus/Incentive Zoning

Through the zoning ordinance and/or comprehensive plan, a locality can provide additional incentives for land development to occur in targeted areas, encouraging growth to occur in greater amounts or in areas with existing infrastructure. Incentives can include density bonuses, fee waivers, and fast-track site development

permitting. Bonus/Incentive Zoning can be used to direct development into existing activity centers and along existing transportation corridors. It is also a valuable strategy used to implement Transit-Oriented Development through its ability to link development density to land uses in transit corridors.

3. Additional ATLAS Strategies for Integrating Land Use and Transportation

The ATLAS study identified almost fifty strategies that might be used to perform integrated land use and transportation planning. In addition to the five that received the most support from local jurisdictions represented on the TCC, EQAC feels that the following five strategies could be particularly effective in improving the link between transportation and land use.

a. Regional Land Use Plan

A Regional Land Use plan has been incorporated into other regions that have authorities that conduct transportation and land use planning. A Regional Land Use Plan could be implemented to have authority over local land use plans if localities delegate such authority. A Regional Land Use plan can also be developed as part of a regional planning effort that is based on the consolidation of local comprehensive plans and is used more for scenario testing than legal authority. The development of a regional land use plan can be used to determine a regional vision and then link transportation projects to the adopted regional plan. This form of plan can also be developed as a non-binding document.

b. Targeted Development Areas

A targeted development area or service area designates a specific area of land for development and growth. Local governments can use their own criteria in defining a targeted development area, and the areas are designated within the comprehensive plan and zoning ordinances. This is one of the primary avenues through which localities can focus development to meet both transportation and land use goals. Localities can concentrate development at transit stations or along primary arterials with excess capacity.

c. High Occupancy Vehicle Preference

Roadways or roadway elements are restricted to use by carpools, vanpools, transit, or other High Occupancy Vehicles during certain time periods. HOV facilities may consist of designated diamond lanes or exclusive facilities separated from conventional traffic by barriers. HOV promotes reduction in regional vehicle miles traveled.

d. Suburban – Scale Transit

One method used to promote alternative modes of transportation is the provision of local shuttles and buses in a jurisdiction. Shuttle services can include service on primary corridors – including business districts, employment and education campuses, and parks or recreation areas. They may connect major activity centers, such as a transit station and a commercial center. Shuttle services may be provided for periods of unusually high demand, such as fairs and sporting events. Some shuttles are free while others require a fare. Shuttle services promote reduction in regional vehicle miles traveled.

e. Telework Centers/Initiatives

Telework refers to various types of distance working arrangements made possible by telecommunications. These include telecommuting, mobile work, and some types of self-employed work that would otherwise require physical travel.

C. THE FAIRFAX COUNTY COMPREHENSIVE PLAN – LAND USE AND TRANSPORTATION GOALS, OBJECTIVES, AND POLICIES

1. Introduction

This section discusses certain goals, objectives and policies Fairfax County has adopted in its Comprehensive Plan. Since this chapter of the *Annual Report on the Environment* deals with the interrelationship of land use and transportation, this section identifies and discusses key elements of the Comprehensive Plan that deal with that interrelationship. There are many other elements of the Comprehensive Plan that deal with land use or transportation and that, if implemented, will contribute to a more livable community. However, those elements are outside the scope of this discussion.

2. Countywide Goals: Land Use and Transportation

a. Land Use

The Comprehensive Plan sets forth the overall goal for land use as follows:

> *The County's land use policies should maintain an attractive and pleasant quality of life for its residents; provide for orderly and coordinated development for both public and private uses while sustaining the economic and social well-being of the County; provide for an adequate level of public services and facilities, including a system of transportation facilities, to sustain a high quality of life; and ensure sound environmental practices in the development and redevelopment of land resources. Growth should take place in accordance with criteria*

and standards designed to preserve, enhance, and protect an orderly and aesthetic mix of residential, commercial/industrial facilities, and open space without compromising existing residential development. The Comprehensive Land Use Plan should set forth long-range recommendations and implementation techniques to ensure the envisioned coordination of harmonious development, while still achieving our economic goals. Densities and heights in excess of those compatible with these goals should be discouraged, nor should these policies be construed as incompatible with the County's affordable housing goal.

b. Transportation

With regard to the County's overall goals for transportation, the Comprehensive Plan sets forth the following:

Land use must be balanced with the supporting transportation infrastructure, including the regional network, and credibility must be established within the public and private sectors that the transportation program will be implemented. Fairfax County will encourage the development of accessible transportation systems designed, through advanced planning and technology, to move people and goods efficiently while minimizing environmental impact and community disruption. Regional and local efforts to achieve a balanced transportation system through the development of rapid rail, commuter rail, expanded bus service and the reduction of excessive reliance upon the automobile should be the keystone policy for future planning and facilities. Sidewalks and trails should be developed as alternate transportation facilities leading to mass transit, high density areas, public facilities and employment areas.

3. Countywide Land Use Objectives and Policies

There are numerous overall objectives and policies set forth in the Comprehensive Plan for land use. Those objectives and policies that best address the interrelationship of land use and transportation are discussed below. Whether these objectives and policies have actually been met is subject to debate. See Chapter II of this report for a discussion of how this concern is related to air quality issues.

Fairfax County recognizes the importance of emphasizing transit use and decreasing dependence on automobiles. One of the County's objectives for land use is to provide a "land use pattern which increases transportation efficiency, encourages transit use and decreases automobile dependency". Policies adopted by the County to implement this objective include: (a) linking existing and future residential development with employment and services and emphasizing ride sharing, transit service and non-motorized access facilities; and (b) concentrating most future development in mixed-use centers and Transit Station Areas to a degree which enhances opportunities for employees to live close to their workplace.

Fairfax County has also recognized that land use intensity can be used to effect the County's ability to provide adequate levels of service for transportation and public facility systems. The County has adopted the objective of using the location and levels of development intensity as a means of achieving a broad range of County goals. Policies adopted by the County to implement this objective include: (a) concentrating the highest level of development intensity in areas of "transportation advantage" including the Tysons Corner Urban Center, cores of Suburban Centers, and Transit Station Areas; (b) limiting development intensity to that which can be accommodated at acceptable levels of service with consideration of the cumulative, long term impacts of development on the adequacy of public facilities and transportation systems; and (c) assigning development intensity in the Tysons Corner Urban Center, as well as cores and areas of redevelopment within Suburban Centers and Transit Station Areas, based upon the ability to offset impact on public facilities and transportation systems and the long term capacity of these systems.

4. Countywide Transportation Objectives and Policies

As with land use, the Comprehensive Plan contains numerous goals and policies that are not discussed herein. Only those transportation objectives and policies that best address the interrelationship of land use and transportation are identified and discussed. Again, whether these objectives and policies have actually been met is subject to debate. See Chapter II of this report for a discussion of how land use considerations relate to air quality issues.

The Comprehensive Plan recognizes that reliance on the automobile, especially single occupant automobile trips, has significantly contributed to the transportation crisis in Northern Virginia and that continued reliance on the automobile is not the solution to that crisis. It is an objective of Fairfax County to provide for both through local movement of people and goods through a multi-modal transportation system that places the maximum practical emphasis on alternatives to the single-occupant automobile. It is the objective of Fairfax County to increase the number of communities using non-motorized transportation and public transportation, including rail, bus, carpooling, and van parking.

Transit facility policies adopted by the County include: (a) providing mass transit facilities, such as rail transit, commuter rail, and/or HOV lanes, in major radial and intracounty corridors including the Shirley Highway, I-66, the Fairfax County Parkway, the Beltway, and the Dulles Access Toll Road; (b) maximizing the benefits of HOV lanes; (c) establishing and expanding park and ride lots along major intercounty and intracounty corridors and at potential future modal transfer points such as rail stations in order to promote transit and HOV usage; and (d) establishing a network of transit centers as necessary to facilitate both intercounty and intracounty travel.

The County has also adopted transit service policies that call for: (a) providing high quality mass transit service in major commuter corridors; (b) providing feeder service between areas of medium to high density residential development and trunk routes, including the Metrorail System; (c) providing transit service between areas of medium to high density residential development, mixed use centers, and employment centers; (d) providing local service within mixed use centers to distribute transit riders on trunk routes and to meet internal circulation needs; and (e) improving the speed, quality, reliability, convenience, and productivity of transit service. Additional transit service policies adopted by the County include: (a) evaluating and, where warranted, implementing innovative technologies, services, and methods that increase transit ridership and/or productivity; (b) increasing transit and HOV usage by developing parking requirements, management, and controls that encourage these uses; and (c) enhancing coordination with neighboring jurisdictions to promote public transit and HOV usage and minimize single occupant vehicle travel.

It is also the objective of the County to provide a comprehensive network of trails and sidewalks to be used as an integral element of the overall transportation network.

The objectives for Transportation expressly provide that Fairfax County's land use and transportation policies should be complementary. Policies adopted by the County to implement this objective include: (a) encouraging relatively high density residential development in mixed use centers to encourage walking trips, to enable more efficient transit service, and to reduce single occupant vehicle use; and (b) supporting public transportation and non-motorized travel through design and development of projects in the Tysons Corner Urban Center, Suburban Centers, Transit Station Areas, and Community Business Centers.

D. IMPLEMENTATION OF THE INTERRELATED GOALS, OBJECTIVES, AND POLICIES FOR LAND USE AND TRANSPORTATION

1. Introduction

As noted in the prior section, Fairfax County has adopted numerous overall objectives and policies for implementing the interrelated goals it has established for land use and transportation. The establishment of Urban Centers, Suburban Centers, and Transit Station Areas in critical locations in the County is a fundamental prerequisite to achieving many of those objectives. Beginning with the establishment of the Tysons Corner Urban Center and continuing through the recent establishment of the Reston-Herndon Suburban Center and Transit Station Areas and the Merrifield Suburban Center, the County is making some progress toward the ultimate achievement of its interrelated transportation and land use goals.

2. Tysons Corner Urban Center

Over the last several decades, Tysons Corner has evolved from a rural crossroads into a substantial suburban business center. The Comprehensive Plan recognizes Tysons Corner as the only area in Fairfax County that is classified as an Urban Center. The Comprehensive Plan envisions a Tysons Corner Urban Center that contains a mixture of high density office, retail and residential uses and parks (including urban parks and active recreation facilities) in a pedestrian-oriented urban environment.

As envisioned in the Comprehensive Plan, the highest development intensities and the most "urban" areas of Tysons Corner will be located within walking distance of future rail stations. Under the Comprehensive Plan, locating rapid rail transit stations in Tysons Corner will allow increased intensity for non-residential and residential development for areas in proximity to each station.

The Dulles Corridor Rapid Transit Project is discussed in Section E. Alternatives evaluated in the Draft Environmental Impact Statement for that project would place none, three, four, or six rail stations in Tysons Corner. The Comprehensive Plan acknowledges that road improvements alone are not adequate to achieve the urban design goals established for Tysons Corner. Rapid rail transit, circulation systems to interface with rail transit, HOV facilities, and transportation demand management are all critical to developing Tysons Corner. While it is obvious that Tysons Corner is yet to fully achieve the urban environment that is envisioned, the integration of land use and transportation planning that is reflected in the Comprehensive Plan provides the means by which that vision might be realized. That vision will not be realized if rail service is not brought to Tysons Corner.

3. Reston-Herndon Area Suburban Center and Transit Station Areas

On May 21, 2001, the Board of Supervisors adopted an amendment to the Comprehensive Plan that created the Reston-Herndon Suburban Center and Transit Station Areas. The Reston-Herndon Suburban Center surrounds the Dulles Airport Access Road from Hunter Mill Road to Centerville Road. The Suburban Center includes three of the four Transit Station Areas in the Dulles Corridor (i.e., the Wiehle Avenue Station, the Reston Parkway Station, and the Herndon-Monroe Station).

As set forth in the Comprehensive Plan, the concept for future development of this Suburban Center envisions a mixed use employment center. The purpose of the new plan for the Suburban Center area is to encourage a more urban and transit-oriented development pattern. The objective is to create, at each Transit Station Area in the Suburban Center, a pedestrian-oriented core area consisting of mixed-use development that includes support services while maintaining transitional areas at the edges of the Transit Station Area.

Options for development in the Transit Station Areas allow higher intensities based upon compliance with specified conditions. Those options are designed to be site specific. Agreement on funding to design and build the Bus Rapid Transit phase of the

Dulles Corridor Rapid Transit Project, including funding for construction of transit stations in the median of the Dulles Airport Access Road, will allow consideration of the transit-oriented options. The rail-oriented mixed-use options, which allow the highest intensities in the Transit Station Areas, may be considered once a Full Funding Grant Agreement or comparable funding agreement to design and build the rail phase of the Dulles Corridor Rapid Transit Project has been executed.

The three transit stations in this Suburban Center are located in the median of the Dulles Airport Access Road. The physical location of these stations provide a unique opportunity to bring people and activities into closer proximity to the transit station platforms by developing mixed use projects in the air rights over the stations. The Comprehensive Plan does not include any specific land use recommendations for air rights development. It does, however, recognize the potential value of such development and recommends that appropriate level of land use planning for future air right development be explored.

4. The Merrifield Suburban Center

On June 11, 2001, the Board of Supervisors adopted an amendment to the Comprehensive Plan that created the Merrifield Suburban Center. The area of the Merrifield Suburban Center is located approximately south of I-66, north of Woodburn Road, west of Holmes Run, and east of Long Branch Stream Valley and Prosperity Avenue. The area is served by the Dunn Loring – Merrifield Metro Station and has regional and local access from I-66, I-495, Route 29, Route 50, and Gallows Road.

As set forth in the Comprehensive Plan, the vision for the Merrifield Suburban Center includes two core areas: one focuses on development near the transit station and the second is planned to evolve into a town center. A new "Main Street" would connect the two core areas. The interrelationship of transportation and land use is evident in the Comprehensive Plan for this Suburban Center, particularly in the following planning objectives for the Suburban Center:

(a) Encourage revitalization and redevelopment of portions of the Merrifield Suburban Center to create more attractive and functionally efficient commercial and residential areas with pedestrian-friendly and transit-oriented environments.

(b) Encourage mixed-use development that includes pedestrian and auto circulation systems that integrate the development both internally and externally, resulting in transit-oriented and pedestrian-friendly environments.

(c) Encourage the development of additional housing (including affordable dwelling units) in the Merrifield Suburban Center so that employees may live near their workplace and transit services, in order to reduce the number and length of commuter auto trips.

(d) Develop a cohesive roadway system that provides a more extensive grid of streets to serve the town center, Transit Station Area, and the area between.

(e) Develop a cohesive pedestrian circulation system linked to open spaces such as plazas, courtyards, greenways, and parkland in order to facilitate walking and reduce reliance on private automobiles.

(f) Develop mass transit options, transportation strategies and planned highway improvements to mitigate traffic impacts in the Merrifield Suburban Center and in adjacent residential neighborhoods.

E. OTHER PROGRAMS, PROJECTS, AND ANALYSIS

1. Dulles Corridor Rapid Transit Project

Rail service has been envisioned in the Dulles Corridor since construction of Washington Dulles International Airport in the late 1950s, when the right-of-way for future rail was reserved in the median of the Dulles Airport Access Road. As discussed in Section D, the Fairfax County Comprehensive Plan integrates land use and transportation planning for the area from Tysons Corner to Dulles Airport based on the expectation that rail service through Tysons Corner to Dulles Airport will be constructed. It is critical that the Dulles Rail project be funded and constructed if those plans are to be realized.

The Draft Environmental Impact Statement for the Dulles Corridor Rapid Transit Project includes an option to commit to rail service in the corridor without interim steps including bus service in lieu of rail. The Draft EIS also includes options for serving Tysons Corner with rail, while the bus rapid transit options would bypass Tysons Corner. It is essential that, if the land use and transportation objectives for this critical corridor are to be realized, rail service must be provided and Tysons Corner, as the designated urban center of Fairfax County, must be served by that rail service.

While it is important to implement rail service in the corridor, it is also important that issues that were overlooked or not fully evaluated in the Draft EIS be considered and resolved in a manner consistent with the goals and objectives of the Comprehensive Plan. The issues that need further evaluation and consideration include: (a) the noise that will be generated from rail service, especially at elevated tracks, as well as from the additional vehicular traffic that will be generated along the corridor; (b) the increased need for feeder bus service centering on the transit stations; (c) the impact on surrounding neighborhoods of increased densities that can be granted in the vicinity of rail stations; (d) the increased traffic, and its impact, from development generated by the availability of rail service; and (e) adequate provision for pedestrian access to transit stations.

2. Northern Virginia Transportation Authority

The transportation crisis in Northern Virginia is a regional challenge. Although Fairfax County can make a difference through implementation of its own transportation and land use planning, the County's goals for transportation and land use will never be fully realized without the cooperation of other jurisdictions in Northern Virginia and the entire Washington Metropolitan area.

The recently created Northern Virginia Transportation Authority (NVTA) presents an opportunity to improve land use and transportation planning for a significant portion of the region. The NVTA was created by the Virginia legislature to oversee transportation spending and to establish the long-term course for addressing the region's transportation problems. If the problems of the past are to be avoided, it is essential that the NVTA recognize the interrelationship of land use and transportation and adopt objectives and policies similar to those adopted by Fairfax County and other local jurisdictions. Similarly, it is essential that local jurisdictions work with the NVTA as they implement and amend their land use policies to maximize the benefits from the transportation investments that are made.

F. RECOMMENDATIONS

1. As demonstrated in its Comprehensive Plan, particularly in the Urban Center, Suburban Center, and Transit Station Area classifications, Fairfax County has recognized the interrelationship of land use and transportation. This interrelationship must continue to be part of the planning and development process. Note should also be taken here, however, to the concerns of EQAC with respect to air quality and water quality as they relate to this planning and development process. The following guidelines are important elements of the planning and development process and are recommend by EQAC:

   a. Provide for multiple use development patterns that reduce automobile dependency, with a mix of jobs, housing, and services in a walkable environment.

   b. Encourage development to be located where it can be served by existing infrastructure.

   c. Provide incentives for concentrations of residential and commercial development along transportation/transit corridors within and near the regional core and regional activity centers, such as zoning, financial incentives, transfer of development rights, priority infrastructure financing, and other measures.

   d. Take advantage of supporting zoning regulations and other tools that will help promote concentration of development within walking distances of transit facilities, and generally promote a pedestrian orientation in new development.

   e. Reduce, rather than increase, vehicles miles traveled (VMT) and VMT per capita in the region.

   f. Promote protection of sensitive environmental, cultural, historical, and neighborhood locations.

2. While the specific impacts of any transportation or development proposal must be evaluated, in general, EQAC recommends that the County implement Comprehensive Plan guidance for the following:

    a. The Tysons Corner Urban Center
    b. The Reston-Herndon Area Suburban Center and Transit Station Areas
    c. The Merrifield Suburban Center

3. EQAC recommends that the Dulles Rapid Transit Project be implemented with an option that brings rail to Tysons Corner and rail to the Dulles Corridor as soon as possible.

4. EQAC recommends that Fairfax County encourage the Northern Virginia Transportation Authority to adopt goals to create a network of transit-oriented, mixed use, pedestrian friendly, livable communities and to avoid additional sprawl and automobile induced congestion.

LIST OF REFERENCES

Fairfax County, Virginia, Policy Plan: The Countywide Element of the Comprehensive Plan, 2000 Edition.

Fairfax County, Virginia, Tysons Corner Urban Center Element of the Comprehensive Plan, 2000 Edition.

Fairfax County, Virginia, Upper Potomac Planning District (Reston-Herndon Suburban Center and Transit Station Area) Element of Comprehensive Plan, 2000 Edition, Amendment No. 2000-1 adopted May 21, 2001.

Fairfax County, Virginia, The Merrifield Suburban Center, 2000 Edition, Amendment No. 2000-02 adopted June 11, 2001.

Transportation Coordinating Council of Northern Virginia, Task Force on Land Use and Transportation, "The alternative transportation and land use activity strategies study." March 28, 2001.

Virginia Department of Rail and Public Transportation and Washington Metropolitan Transit Authority, Draft Environmental Impact Statement and Proposed General Plans for the Dulles Corridor Rapid Transit Project, June 2002.

Steven R. Suder, Memorandum to the TCC Technical Committee, Expanded Technical Committee, and Citizen Advisory Committee and attachment regarding Draft Land Use and Transportation Study, January 26, 2001.

McLean Citizens Association, Resolution on the Dulles Corridor DEIS, August 14, 2002.

Washington Regional Network for Livable Communities, Making the Most of Metro: Community Building Through Transit, undated.

Coalition for Smarter Growth, Better Communities, Less Traffic: Solutions and Choices for Metropolitan Washington, available on the web at www.smartergrowth.net/smartgrowth/alternatives.php.

An excellent bibliography of additional resource materials on the land use and transportation can be found at www.washingtonregion.net/html/furtherreading.html

APPENDIX A

EQAC RESOLUTIONS AND POSITIONS NOVEMBER, 2001 THROUGH SEPTEMBER, 2002

CONTENTS

At its November 14, 2001 meeting, EQAC voted to support the following two legislative proposals that had been recommended to the Board of Supervisors by the Fairfax County Tree Commission.

Proposed Amendments to Virginia State Code § 15.2-961
Relating To Tree Cover Requirements

§ 15.2-961. ~~Replacement~~ *Conservation* of trees during development process in certain localities.

A. Any locality with a population density of at least seventy-five persons per square mile may adopt an ordinance providing for the ~~planting and replacement~~ *conservation* of trees during the development process pursuant to the provisions of this section. Population density shall be based upon the latest population estimates of the Cooper Center for Public Service of the University of Virginia.

B. The ordinance shall require that the site plan for any subdivision or development include the ~~planting and replacement~~ *conservation* of trees on the site to the extent that, at twenty years, minimum tree canopies or covers will be provided in areas to be designated in the ordinance, as follows:

1. Ten percent tree canopy for a site zoned business, commercial, or industrial;

2. Ten percent tree canopy for a residential site zoned twenty or more units per acre;

3. ~~Fifteen~~ *Twenty* percent tree canopy for a residential site zoned more than ten but less than twenty units per acre; and

4. ~~Twenty~~ *Thirty* percent tree canopy for a residential site zoned ten units or less per acre.

However, any city that was established prior to 1780 may require at ten years the minimum tree canopies or covers set out above.

C. The ordinance shall require that site plans provide for the preservation of existing trees and/or the replacement of trees.

1. If tree cover exists on site prior to development, then a proportionate amount of the required tree cover defined above shall be met through the preservation of existing trees.

2. Predevelopment tree cover percentages shall be used to determine the minimum proportion of existing tree cover area to be preserved. The remainder of the required tree cover will be met through the planting of trees.

D. As incentive to conserve trees and to optimize the level of environmental values they provide, localities may extend up to two times the normal area of tree cover credit for trees that are preserved to fulfill the following criteria:

1. The ordinance may grant additional tree cover area credits for the preservation of on-site tree cover that is contiguous to tree cover on adjacent properties. In order to receive additional

canopy credits, the connecting tree cover areas shall occur on dedicated open space, park land, conservation easements or land of a similar designation, where the long-term preservation of trees is implied.

2. The ordinance may grant additional tree cover area credits to encourage the preservation of buffers adjacent to Resource Protection Areas as defined by the local Chesapeake Bay Ordinance. The trunks of trees receiving these credits must be located no more than fifty feet from the outer edge of the Resource Protection Area.

3. The ordinance may grant additional tree cover credits to encourage the preservation of existing trees to serve as buffers between sites of dissimilar use. The tree buffer width must be at least twenty-five feet in width to receive such credits.

4. The ordinance may grant additional tree cover area credits for the preservation of trees with historic or cultural significance.

5. The ordinance may grant additional tree cover area credits for the preservation of specimen trees of outstanding size or possessing unique physical characteristics.

6. The ordinance may grant additional tree cover area credit for the preservation of trees that are components of a rare or endangered habitat or ecosystem.

7. The ordinance may grant additional tree cover area credits for trees preserved in a manner which will conserve the energy used to cool and heat buildings. The locality may designate a list of suitable tree species and effective locations to facilitate energy conservation.

8. The ordinance may grant additional tree cover area credits for trees preserved in a manner which will cool paved surfaces and parked motor vehicles.

The ordinance shall provide for reasonable exceptions to or deviations from these requirements to allow for the reasonable development of farm land or other ~~areas devoid of woody materials~~, *areas devoid of healthy or suitable woody materials,* for the preservation of wetlands, or otherwise when the strict application of the requirements would result in unnecessary or unreasonable hardship to the developer. The following shall be exempt from the requirements of any tree ~~planting and replacement~~ *conservation* ordinance promulgated under this section: dedicated school sites, playing fields and other nonwooded recreation areas, and other facilities and uses of a similar nature.

The ordinance will provide for exceptions or deviations from the tree preservation requirements delineated in C. above, if the locality determines that the requirements would preclude or significantly hinder uses allowed by local zoning ordinance. If the tree preservation requirements are waived or modified on these sites, then the balance of the minimum tree cover requirements will be met by the planting of trees.

For purposes of this section:

"Tree canopy" or "tree cover" includes all areas of coverage by plant material exceeding five feet in height, and the extent of *planted tree* canopy at *ten or twenty* maturity shall be based on published reference texts generally accepted by landscape architects, nurserymen, and arborists in the community, and the texts shall be specified in the ordinance. *"Predevelopment tree cover levels" shall be defined by the total percentage of the development site that is covered by tree canopy or cover at the time of plan submission.*

The ordinance may designate or provide a system for rating the desirability for *the* planting *and preservation* of various tree species. All trees to be planted shall meet the specifications of the American Association of Nurserymen. The planting of trees shall be done in accordance with either the standardized landscape specifications jointly adopted by the Virginia Nurserymen's Association, the Virginia Society of Landscape Designers and the Virginia Chapter of the American Society of Landscape Architects, or the road and bridge specifications of the Virginia Department of Transportation.

Existing trees which are to be preserved may be included to meet all or part of the canopy requirements, and may include wooded preserves, if the site plan identifies such trees and the trees meet standards of desirability and life-year expectancy which the locality may establish.

~~C.~~ *E.* Penalties for violations of ordinances adopted pursuant to this section shall be the same as those applicable to violations of zoning ordinances of the locality.

~~D.~~ *F.* In no event shall any local tree ~~planting and replacement~~ *conservation* ordinance adopted pursuant to this section exceed the requirements set forth herein.

~~E.~~ *G.* Nothing in this section shall be construed to invalidate any local ordinance adopted pursuant to the provisions of this section prior to July 1, 1990, which imposes standards *for ten year minimum* tree *cover* replacement or planting during the development process.

H. Nothing in this section shall be construed to invalidate any local ordinance adopted by a city that was established prior to 1780 which imposes standards for ten year minimum tree cover replacement or planting during the development process.

I. Nothing in this section shall be construed to invalidate any local ordinance adopted pursuant to the provisions of this section after July 1, 1990, which imposes standards for twenty year minimum tree cover replacement or planting during the development process.

Proposed Amendments to Virginia State Code, Section 15.2-961
To Enable Localities To Regulate The Use of Native and Other Desirable Trees

Section 15.2-961. Replacement of trees during development process in certain localities.

A. Any locality with a population density of at least seventy-five persons per square mile may adopt an ordinance providing for the planting and replacement of trees during the development process pursuant to the provisions of this section. Population density shall be based upon the latest population estimates of the Cooper Center for Public Service of the University of Virginia.

B. The ordinance shall require that the site plan for any subdivision or development include the planting or replacement of trees on the site to the extent that, at twenty years, minimum tree canopies or covers will be provided in areas to be designated in the ordinance, as follows:

1. Ten percent tree canopy for a site zoned business, commercial, or industrial;

2. Ten percent tree canopy for a residential site zoned twenty or more units per acre;

3. Fifteen percent tree canopy for a residential site zoned more than ten but less than twenty units per acre; and

4. Twenty percent tree canopy for a residential site zoned ten units or less per acre.

However, any city that was established prior to 1780 may require at ten years the minimum tree canopies or covers set out above.

The ordinance shall provide for reasonable exceptions to or deviations from these requirements to allow for the reasonable development of farm land or other areas devoid of woody materials, for the preservation of wetlands, or otherwise when the strict application of the requirements would result in unnecessary or unreasonable hardship to the developer. The following shall be exempt from the requirements of any tree replacement or planting ordinance promulgated under this section: dedicated school sites, playing fields and other nonwooded recreation areas, and other facilities and uses of a similar nature.

For purposes of this section:

“Tree canopy” or “tree cover” includes all areas of coverage by plant material exceeding five feet in height, and the extent of canopy at maturity shall be based on published reference texts generally accepted by landscape architects, nurserymen, and arborists in the community, and the texts shall be specified in the ordinance.

The ordinance may ~~designate or~~ provide a system ~~for rating the desirability for planting of various tree species~~ *to designate the tree species that can and cannot be planted in order to receive tree canopy credits. The ordinance may preclude the use of certain tree species based on their tendency to cause negative impacts to native plant communities, or based on inherent physiological traits that lend themselves to premature structural failure of trees.* All trees to be planted shall meet the specifications of the American Association of Nurserymen. The planting of trees shall be done in accordance with either the standardized landscape specifications jointly adopted by the Virginia Nurseryman's Association, the Virginia Society of Landscape Designers and the Virginia Chapter of the American Society of Landscape Architects, or the road and bridge specifications of the Virginia Department of Transportation.

Existing trees which are to be preserved may be included to meet all or part of the canopy requirements, and may include wooded preserves, if the site plan identifies such trees and the trees meet standards of desirability and life-year expectancy which the locality may establish.

C. Penalties for violations of ordinances adopted pursuant to this section shall be the same as those applicable to violations of zoning ordinances of the locality.

D. In no event shall any local tree replacement or planting ordinance adopted pursuant to this section exceed the requirements set forth herein.

E. Nothing in this section shall be construed to invalidate any local ordinance adopted pursuant to the provisions of this section prior to July 1, 1990, which imposes standards for tree replacement or planting during the development process.

This resolution was not adopted officially by the Environmental Quality Advisory Council. However, in a poll of individual Council members that was conducted subsequent to the Council's January 9, 2002 meeting, a majority of Council members expressed support for it.

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

RESOLUTION REGARDING
TREE PRESERVATION, TREE PLANTING, AND TREE COVER
January, 2002

WHEREAS, The planting of native and other desirable trees ensures the ecological health of the County's open space and natural areas; and

WHEREAS, The planting of native and other desirable trees ensures direct benefits to wildlife and native plant communities; and

WHEREAS, The planting of native and other desirable trees has proven benefits in helping the County support the Chesapeake Bay 2000 agreement; and

WHEREAS, The preservation of mature riparian forest buffers has proven benefits in helping the County support the Chesapeake Bay 2000 agreement; and

WHEREAS, Preservation of mature tree buffers between sites of dissimilar use helps maintain and enhance the quality of life in the County; and

WHEREAS, Preservation of total tree coverage can provide ecological benefits; and

WHEREAS, Low, moderate, and high density residential development creates special challenges for localities relating to tree preservation, tree planting, and tree cover; and

WHEREAS, Amendments to the Zoning Ordinance, Subdivision Ordinance and the Public Facilities Manual (PFM) are being proposed in order to update, clarify, and codify various requirements regarding tree preservation, tree planting, and tree cover; and

WHEREAS, These proposed amendments would clarify the various requirements dealing with the methodology for determining tree cover, selection of trees, and the procedures for restoration efforts within Resource Protection Areas; now therefore

BE IT RESOLVED, That the Environmental Quality Advisory Council (EQAC) supports the County staff recommendations that the proposed amendments to the Zoning Ordinance, Subdivision Ordinance and the Public Facilities Manual (PFM) regarding tree preservation, tree planting, and tree cover be adopted by the Board of Supervisors; and

BE IT FURTHER RESOLVED, That EQAC recommends that the printing and distribution of the updated Zoning Ordinance, Subdivision Ordinance and the Public Facilities Manual (PFM) regarding tree preservation, tree planting, and tree cover be expedited.

ENVIRONMENTAL QUALITY ADVISORY COUNCIL
RESOLUTION REGARDING
REGIONAL STORMWATER MANAGEMENT

February 13, 2002

WHEREAS, The Fairfax County Board of Supervisors approved a Policy Plan Amendment regarding Stream Protection on October 30th, 2000 that updated stream protection language and definitions that govern the review of development applications; and

WHEREAS, This amendment was not intended to address the full range of stream protection and restoration issues; and

WHEREAS, In recent years, there have been advances in the way stormwater is managed, including managing stormwater as close to the source as feasible, the use of bioretention and low impact site design practices; and

WHEREAS, The County has successfully initiated a Stream Protection Strategy and embarked on a comprehensive Watershed Management Strategy; and

WHEREAS, Watersheds are interconnected, with watersheds for smaller streams forming the watersheds of larger bodies of water; and

WHEREAS, Protecting and restoring watersheds is necessary to the County's goals of protecting water quality and the ecological integrity of its streams; and

WHEREAS, The County's Regional Stormwater Management Plan was approved by the Board in 1989 and has not been reviewed in context with these new initiatives; and

WHEREAS, Waivers are routinely approved administratively during site plan approval because regional stormwater ponds are in the plan; and

WHEREAS, The County does not have adequate funding to construct many of these planned facilities yet development continues, leaving streams in the County with inadequate protection from stormwater and subject to flooding and degradation; and

WHEREAS, When funding is available, the planned regional ponds are being constructed without an adequate analysis of the impact on stream ecosystems and morphology; and

WHEREAS, Recent research demonstrates that such ponds can actually be harmful to aquatic ecosystems and riparian habitat, and may not adequately filter out the pollutants that reach the County's streams; and

WHEREAS, Many of the proposed and current stormwater management facilities and regional ponds maybe inconsistent with our commitments under the Chesapeake Bay Preservation Act to minimize impact on, restore, and protect the health of tributary streams; now therefore

BE IT RESOLVED, That EQAC recommends that the Board of Supervisors review and revise the County's Regional Stormwater Management Plan in context of the Stream Protection Strategy and the development of the County's Master Watershed Plan, including necessary amendments to the Policy Plan.

RESOLUTION TO SUPPORT THE PROPOSED AMENDMENTS TO THE FAIRFAX COUNTY CHESAPEAKE BAY ORDINANCE

February 13, 2002

WHEREAS, The Commonwealth of Virginia and Fairfax County have committed to the restoration and protection of the Chesapeake Bay; and

WHEREAS, The Commonwealth of Virginia passed the Chesapeake Bay Preservation Act in 1988 to ensure Virginia's contribution to the partnership to restore and protect the Chesapeake Bay; and

WHEREAS, The protection and restoration of the Chesapeake Bay is dependent upon the protection and restoration of individual rivers and streams in the Chesapeake Bay watershed, including the Potomac River and local streams within Fairfax County; and

WHEREAS, The Fairfax County Chesapeake Bay Preservation Ordinance, enacted in 1993, seeks to protect sensitive streamside forestland and aquatic resources by limiting development in Resource Protection Areas (RPAs) that border streams and rivers in the County; and

WHEREAS, The current ordinance allows exceptions to the law that can result in potentially harmful development in RPAs; and

WHEREAS, The current ordinance has no provisions for issuing fines or imposing penalties for violations of the ordinances; and

WHEREAS, The newly proposed amendments include: restricting removal of trees within the RPA; requirements for written approval for before any pruning or cutting may proceed, and limiting total clearing to 5,000 square feet or 25% of the buffer area, whichever is less; and prohibiting boardwalks, pathways, and paved paths greater than four feet in width; and

WHEREAS, The proposed amendments also include designating RPA violations as Class One misdemeanors and instituting civil penalties up to $5,000 for each day of violation; now therefore

BE IT RESOLVED THAT the Fairfax County Environmental Quality Advisory Council supports the immediate adoption of the proposed amendments to the Chesapeake Bay Ordinance in Fairfax County.

This response was not adopted officially by the Environmental Quality Advisory Council. However, in a poll of individual Council members that was conducted subsequent to the Council's February 13, 2002 meeting, a majority of Council members expressed support for it.

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

RESPONSE TO THE VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY'S DRAFT FECAL COLIFORM TMDL FOR ACCOTINK CREEK
February, 2002

The Environmental Quality Advisory Council (EQAC) has reviewed the proposed Virginia Department of Environmental Quality (DEQ) Total Maximum Daily Load (TMDL) for Accotink Creek. EQAC strongly supports improvements in water quality in streams, creeks, and other water bodies within the County. However, the proposed TMDL presents concerns regarding the process for proposal and public comment, the use of data from an unsubstantiated simulation model, and the proposal of reduction goals for which solutions cannot be implemented and that cannot, as a result, be achieved. We request that the Board of Supervisors forward the following comments on the Accotink TMDL to the DEQ in response to requests for comment.

First, we are deeply troubled by the process for obtaining public input and comment. An announcement was made in December for a January 9, 2002 public meeting, with public comments originally due by January 29, 2002. This date was subsequently extended to February 28, 2002. However, supporting documentation, including a critical U.S. Geological Survey (USGS) Bacteria Source Tracking study that is utilized in the TMDL development, are not available for review.

Second, the proposed waste load reduction scenarios are based on preliminary data and TMDL models that may or may not be appropriate for this application. The final study from USGS supporting the TMDL development is currently undergoing peer review and will not be available in its entirety until March 18, 2002, after the close of the comment period. This report will substantiate bacteria load allocations with information regarding modeling, yet neither the County staff nor the public can review assumptions made in the modeling and comment on their appropriateness. As a result, the TMDL is being developed using preliminary data that have not gone through an adequate peer review process. The use of unreviewed, preliminary data in the establishment of the Accotink Creek TMDL is unacceptable from both a scientific and regulatory standpoint. The problems associated with the use of preliminary, unreviewed USGS data are further compounded by the models being used in the development of the TMDL. The model used to develop the TMDL is simplistic and does not reflect the reality of modeling a water body that receives bacteria loadings from two different jurisdictions (Fairfax City and Fairfax County) and does not consider the municipal separate storm sewer system (MS4). It is our considered opinion that the TMDL process for Accotink Creek is being unduly and unnecessarily accelerated to meet arbitrary deadlines established by DEQ.

Finally, the results of the modeling are proposed TMDL waste load reductions that are not achievable. For example, geese represent 24 percent of the fecal coliform sources identified. The TMDL would call for a 92 to 98 percent reduction in fecal coliform from geese and ducks located on pervious land surfaces (such as yards, parks, and forests) and a 93 to 99 percent reduction in fecal coliform from geese on impervious surfaces (such as parking lots and roads). Geese are a protected species in Virginia, and the elimination of geese (as well as other wildlife) is impractical. It is highly unlikely that these reductions can be achieved through population control. Thus, the County will be faced with an unachievable TMDL. Of particular concern is the potential that noncompliance with the specified TMDL could be tied to the County's VPDES permit and result in fines for failure to improve an impaired water body.

EQAC is firmly committed to the improvement of water quality in the County and state-wide. Alternatives exist that can be implemented by Virginia that will result in improvements in the water quality in Accotink Creek, but at levels that are achievable and with solutions that are implementable. Under the U.S. Environmental Protection Agency's Use Attainability standard, states can demonstrate that the water quality goals cannot be achieved. Virginia can seek relief for Accotink Creek, and other such water bodies, where a significant source of the impairment is wildlife. Such relief would allow DEQ to establish a reasonable TMDL that can be implemented.

This position was supported by a majority of EQAC members and was forwarded to the Board of Supervisors on April 19, 2002 as an unofficial position. The position was adopted, by a unanimous vote of members present, as a resolution on May 8, 2002

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

RESOLUTION REGARDING THE PROPOSED ELIMINATION
OF THE
HEALTH DEPARTMENT STREAM MONITORING PROGRAM

April 19, 2002/May 8, 2002

WHEREAS, all Fairfax County departments and agencies have been asked by the County Executive to reduce their FY2003 budgets by five percent; and

WHEREAS, the Department of Health has proposed to eliminate $66,407 from its budget by total elimination of the Health Department Stream Monitoring Program, which is currently staffed by one part-time position and one intermittent temporary position; and

WHEREAS, this monitoring program is critical to the identification and control of fecal coliform and chemical pollution of our streams, lakes and watersheds; and

WHEREAS, the Department of Health has suggested that this activity might be undertaken by the Stream Protection Program in the Department of Public Works and Environmental Services (DPWES) or the Virginia Department of Environmental Quality (DEQ); and

WHEREAS, DPWES does not have the requisite laboratory facilities nor the personnel trained in the requisite technical methodologies, and would require a budget supplement if it were required to undertake this function; and

WHEREAS, the state DEQ does not have the capabilities for accepting such a transfer of responsibility; now therefore

BE IT RESOLVED, the Environmental Quality Advisory Council urgently requests the Board of Supervisors to direct the Department of Health **not to eliminate** the program to monitor fecal coliform and chemical pollution of Fairfax County streams and to retain the necessary budgetary allocation for it; and

BE IT FURTHER RESOLVED, that if the Adopt-a-Stream Program, currently under Health Department aegis, can be better handled by a consortium of agencies, this be considered even though no overall budgetary reduction is realized.

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

Board of Supervisors
County of Fairfax
12000 Government Center Parkway
Fairfax, VA 22035

July 24, 2002

Dear Madam Chairman and Members of the Board:

This is to inform you of an incident that occurred on June 10, 2002 during which approximately 200,000 gallons of raw sewage were spilled onto the Little Rocky Run stream valley and during which the proper authorities in Fairfax County were not notified. This incident occurred in close proximity to houses and yards.

A Fairfax County citizen became aware that the spillage occurred at the Little Rocky Run pumping station, which is located along Compton Road near Route 28 and which is operated by the Upper Occoquan Sewage Authority (UOSA). After several telephone calls by the citizen, it became evident that neither the Fairfax County Water Authority nor the Fairfax County Department of Health had any knowledge of this incident. EQAC is also aware that the Hazardous Materials and Investigative Services Section of the Fairfax County Fire and Rescue Department was also unaware of this release. We understand that UOSA did contact the Virginia Department of the Environmental Quality (DEQ) to report the incident. DEQ did not provide the proper notifications to authorities in Fairfax County.

Furthermore, 48 hours after the incident occurred, it was observed that no signage was posted at or near the site of the release informing the public of this incident or warning citizens to avoid contact with Little Rocky Run. This incident occurred near several communities and therefore presented a health risk to the public. Fortunately, about 60 hours after the incident, Fairfax County received a major rain event that provided necessary cleansing in the affected area, thereby minimizing impacts to the public. However, we would like to emphasize to the Board that proper notifications to the various County agencies and the public did not occur, and coordination with County hazardous materials units did not occur.

By a unanimous vote of the members present at the July 10, 2002 EQAC meeting, EQAC approved a motion to recommend that the Board of Supervisors forward a strong letter of concern to the Department of the Environment Quality, urging them of the need to provide notification to the local government where the event occurred when an event like this happens. Through this correspondence, I am making this request on behalf of EQAC.

Sincerely,

(signed by Chairman)

Robert D. McLaren, Chairman
Environmental Quality Advisory Council

cc: EQAC File, July, 2002

Position adopted by EQAC, July 10, 2002

2003 GA POSITION FORM -- LEGISLATION OR FUNDING POSITION STATEMENT RECOMMENDED BY THE FAIRFAX COUNTY ENVIRONMENTAL QUALITY ADVISORY COUNCIL

Legislative or funding position statements for Board endorsement or opposition relate to key legislative or budget issues which are important to Fairfax County and which may be considered by the General Assembly. Brief appropriate background information and the reason for the proposed position also should be included with each request (statutory language is not necessary). Please submit your budget amendment initiative using the following form:

GENERAL SUBJECT AREA -- TITLE OF PROPOSAL: Tree Conservation

PROPOSAL: *(brief description of the position)*

Support legislation that:

(1) allows local governments to require that a percentage of required tree canopy be fulfilled through tree conservation;

(2) allows local governments to ban the planting of trees that satisfy canopy requirements if the trees are invasive, are known to be structurally unsound, or can cause damage to nearby structures; and

(3) increases the amount of tree canopy required after 20 years in certain categories.

BACKGROUND: *(briefly summarize why the position is necessary to the County; list any pros/cons, any previous General Assembly or Board of Supervisors' action or position, whether there has been any General Assembly study of this issue, or any other helpful information -- this section should be* ***no more than 2-3 paragraphs****)*

In the last General Assembly, three tree conservation bills were introduced but not passed. One of these, Senate Bill 484, was sponsored by Fairfax County. SB 484 would have provided for the measures noted above in the "proposal" section.

At present, Fairfax County cannot require any tree conservation. Tree canopy requirements can be satisfied completely through planting – and this is done too often. However, mature communities of trees are low-cost self-generating systems that are very efficient at purifying both water and air, mitigating storm water runoff and moderating ambient air temperature. These benefits do not exist with planted trees until many years after their planting. If Fairfax County had the authority to require conservation of trees, we would see a number of benefits, particularly to our stressed streams and stream valleys.

EQAC therefore recommends that the Fairfax County Board of Supervisors continue to support tree conservation as part of the current Legislature package. Additionally, EQAC recommends that the Board of Supervisors continue its support of SB 484.

STAFF CONTACT PERSON(S): *(provide name/phone number of County staff person(s) best able to able to provide any additional research or information necessary)*

This position has been recommended by the Fairfax County Environmental Quality Advisory Council (EQAC). The following members of EQAC can provide further guidance: Bob McLaren (Chairman), [redacted]; and Stella Koch (Vice Chairman), [redacted]. Noel Kaplan, Department of Planning and Zoning (the staff liaison to EQAC), can also assist if further information is needed. Noel can be reached at [redacted].

POSSIBLE SUPPORT OR OPPOSITION BY ORGANIZATIONS: *(list any organizations or groups, if any, which might be in favor of or against the proposed position)*

EQAC has not solicited support for its recommended position but would anticipate that numerous environmental advocacy groups would be supportive of it. Development interests may oppose it.

Endorsed by EQAC, September 11, 2002

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

M E M O R A N D U M

TO: Robert A. Stalzer
Deputy County Executive

FROM: Environmental Quality Advisory Council (Drafted by J. Craig Potter)

DATE: August 28, 2002 (Sent via e-mail)

SUBJECT: Air Quality Management/Fairfax County

BACKGROUND/DISCUSSION

In the 2000 Annual Report on the Environment ("ARE"), EQAC initiated a "big picture" analysis with related recommendations regarding air quality planning and management capabilities and needs in Fairfax County. The ARE conclusions followed the discussion of a series of inter-related problems (summarized below) that have combined to make the air quality management situation extremely difficult in Fairfax County. EQAC concluded the 2000 ARE by recommending that the County take steps to integrate air quality planning needs directly into the County planning process, possibly through the establishment within the County of its own air quality planning capability. In response to this recommendation and the other related recommendations, staff largely agreed with the recommendations of EQAC, but also recommended that in the meanwhile EQAC might …"wish to better define or identify areas where it feels attention needs to be directed." This latter point and some of the other staff responses were clearly made in recognition of the fact that the process of establishing a new planning position might take some time and that in the meanwhile EQAC might be able to help refine the nature of the problems and perhaps also the solutions.

The inter-related problems that were summarized in the 2000 ARE included (1) ongoing litigation over transport of nitrogen oxides (NOx); (2) the then-pending challenge to the newly promulgated ozone eight-hour standard; (3) the difficulties and shortcomings associated with Phase II Attainment Planning (rate of progress planning) for Northern Virginia; (4) the complexities associated with SIP planning in Northern Virginia, and; (5) the increasing likelihood of difficulties associated with need for conformity analysis associated with transportation planning and construction in Northern Virginia.

Subsequently, in the 2001 ARE, the same issues were discussed with somewhat more urgency since the Supreme Court subsequently rejected industry petitions on the NOx SIP call and had also rejected challenges to the new ozone eight-hour standard. The 2001 ARE went on to describe the continuing difficulties with Phase II Attainment Planning, the failure of EPA to complete its mobile 6 air quality model in a timely manner, and the increasing likelihood of problems associated with conformity. Finally, the 2001 ARE made special note of the pending Sierra Club (Earth Justice Legal Defense Fund) law suit filed against EPA seeking the rejection

of the approved extension for the Washington Metropolitan area attainment deadline. This last law suit, in particular, substantially heightened EQAC's concerns about the situation and led to our reiteration of the essential recommendation in the 2000 ARE that the County takes steps as soon as possible to integrate air quality planning through the establishment of air quality planning capability in the County. Now that the D.C Court of Appeals has rejected the extension of the nonattainment deadline and sustained the arguments of the Sierra Club, the situation has become even more dire.

The essential thrust of the key recommendation of EQAC throughout this time has been that the County must develop its own capability to systematically evaluate air quality compliance needs and address them more directly within the context of the many air-quality-related management activities that are directly managed through the operations of the County under the auspices and guidance of the Board of Supervisors. Further, EQAC recommended and continues to support the notion that the County, perhaps through the Environmental Coordinating Committee ("ECC") or other appropriate County entities, including EQAC, heighten its focus on air quality planning needs, whether or not additional staffing occurred.

Again, the staff responses to these air quality management recommendations have been largely supportive, while recognizing, as before, that establishing a direct air quality planning capability in the County might take some time. Meanwhile, EQAC has begun to study the relationship between land use, transportation, and air quality matters in a more deliberative manner at the same time that staff clearly continues to acknowledge that County efforts with respect to regional air quality planning falls short of the level of effort that is needed.

No matter what happens, EQAC is prepared to move forward within its limited venue to continue to address these issues in any way that it possibly can in cooperation with other entities in the County that might be able to be helpful. As a result, EQAC has scheduled a meeting with the Planning Commission Environment Committee and the Transportation Advisory Commission ("TAC") on September 11, 2002. EQAC anticipates that this meeting will be the beginning of a limited effort to discuss and focus County needs as they relate to air quality management and planning.

We anticipate that, as a result of this meeting, we will begin to develop more insight into where the Planning Commission is on these issues and how they are currently addressing needs associated with these matters. We also anticipate that at the same time we will have discussions with the TAC on related activities that they are undertaking that may be helpful. Meanwhile, the nature of the planning crisis continues to escalate.

RECOMMENDATION

Even assuming the most successful outcome from the September 11 meeting, EQAC continues to recommend that the ECC, through the efforts of Mr. Stalzer and other of its key members, take all possible steps to create a senior staff position so that air quality planning can be integrated more directly into the County planning process, as we have suggested. EQAC remains available to discuss and coordinate the thrust of this effort so that it is accomplished in a fiscally responsible manner and in a manner that will fulfill the needs of the County as they relate to this problem. In order to initiate this in the most satisfactory fashion, EQAC believes

that the County should hire at least one air quality planner (and possibly two) with sufficient staff support to do the job. We cannot overemphasize the need to carefully focus the search on a person or persons with qualifications necessary to do the job. With that in mind, we have attached a job description that we think may help to define County planning needs as they relate to this problem.

JOB DESCRIPTION

Recommended Experience

- Senior air quality management capability including, if possible, Federal air quality management experience. Specific experience should include detailed knowledge about and if possible experience with Federal air quality programs and particularly with SIP management needs in the states and regions. Direct experience with non-attainment program management is also critical, including detailed knowledge regarding the stationary air quality management program of the U.S. EPA.

- Familiarity with ozone formation and atmospheric chemistry with particular emphasis on ground level ozone transport. This includes knowledge of precursor air quality chemistry and especially air quality modeling.

- Ability to work with people in politically charged and sensitive situations. This includes not only the ability to absorb and analyze complex scientific and regulatory details but also the ability to persuasively interpret and accurately summarize those materials for decision-makers who may not be as technically proficient.

- Familiarity with County and local government structure and operations, preferably in Fairfax County.

Whoever staffs this position will need to have appropriate access to the Board of Supervisors and other entities within the County who make decisions relating to air quality management. It goes without saying that this position will be of little benefit if appropriate lines of authority and responsibility are not created to actually integrate the work of this planner into the many activities of the County that bear on these issues. Most important, this staff position should carry with it the responsibility of representing the County and assisting elected officials and others who are involved in interactions with COG and with the Commonwealth of Virginia as well as with the State of Maryland.

FOLLOW-UP NECESSARY

In order to maximize the likelihood of success of this initiative, it would be advisable to consider what steps, if any, will need to be taken to actually integrate planning capabilities into the Fairfax County system. What this means is that there needs to be recognition that planning capability will mean nothing unless the results of that capability can be adequately integrated into County activities. Merely hiring a County planner will not solve the problems that the County is now facing in this area. It will be essential that the planner be empowered and supported in his or her efforts to use his or her expertise in a way that facilitates the development

goals of the County but also accomplishes air quality management needs, which may sometimes run counter to those goals and objective. Along with the creation of this position should be the recognition that land use management issues and transportation management issues in particular will need to be managed in a manner that is more consistent with air quality management objectives.

JCP/jm

APPENDIX B

FAIRFAX COUNTY
ENVIRONMENTAL EXCELLENCE AWARDS

The Fairfax County Environmental Excellence Awards have been established to recognize County residents, organizations, businesses, and County employees who unselfishly dedicate time, energy, and expertise for the betterment of the environment in support of countywide environmental goals and initiatives. Award recipients are selected by the Environmental Quality Advisory Council, and the awards are presented each fall during a meeting of the Fairfax County Board of Supervisors.

The recipients of the 2002 Environmental Excellence Awards were:

County Resident Award:	Charlie Creighton
Organization Award:	Hickory Farms Community Association

Charlie Creighton was recognized for his vision, leadership, dedication, and determination in the successful effort to preserve the Meadowood Farm property on Mason Neck as open space. The Hickory Farms Community Association was recognized for its exemplary stewardship of environmental resources through a variety of initiatives to enhance the environmental value of the community's common open space areas – including the restoration of some of these mowed open space areas to a natural vegetated condition. EQAC congratulates both recipients.

In past years, Environmental Excellence Awards have been awarded to the following people and organizations:

<u>2001</u>

County Resident Award:	Chris Koerner
Organization Award:	Bailey's Beautification Alliance

<u>2000</u>

County Resident Award:	Norma Hoffman
Organization Award:	Friends of Sugarland Run
County Government Employee Award:	Gary Roisum

The nomination period for the Environmental Excellence Awards occurs during the spring of each year. EQAC encourages interested individuals, organizations, County employees, and businesses to submit nominations.

APPENDIX C

ACRONYMS USED WITHIN THE ANNUAL REPORT

°C	**Degrees Centigrade**
°F	**Degrees Fahrenheit**
A&F	**Agricultural and Forestal**
ACM	**Assessment of Corrective Measures**
ANS	**Audubon Naturalist Society**
ANSI	**American National Standards Institute**
AQI	**Air Quality Index**
ARE	**Annual Report on the Environment**
ATC	**Air Traffic Control**
ATLAS	**Alternative Transportation and Land Use Strategies**
BMP	**Best Management Practice**
BOD	**Biochemical Oxygen Demand**
BOS	**Board of Supervisors (County)**
BWI	**Baltimore Washington International Airport**
CAA	**Clean Air Act (Federal)**
CAAA	**Clean Air Act Amendments (Federal)**
CBLAB	**Chesapeake Bay Local Assistance Board (State)**
CBLAD	**Chesapeake Bay Local Assistance Department (State)**
CBP	**Chesapeake Bay Program (Regional)**
CCR	**Consumer Confidence Report**
CDC	**Centers for Disease Control (Federal)**
CDM	**Camp, Dresser and McKee**
CESQG	**Conditionally Exempt Small Quantity Generator**
CO	**Carbon monoxide**
COG	**Metropolitan Washington Council of Governments (Regional-Also cited as MWCOG)**
CO-OP	**Cooperative Water Supply Operations**
CY	**Calendar Year**
D.O.	**Dissolved Oxygen**
D/DB-P	**Disinfectant/Disinfection By-products**
dB	**Decibel**
dBA	**Decibel (A-weighted level scale)**
DCR	**Department of Conservation and Recreation (State)**
DEQ	**Department of Environmental Quality (State)**
DIYers	**Do-it-yourselfers**

DNL	**Day-Night sound level (also referred to as "Ldn")**
DPWES	**Department of Public Works and Environmental Services (County)**
DPZ	**Department of Planning and Zoning (County)**
DSWCR	**Division of Solid Waste Collection and Recycling (County)**
DSWDRR	**Division of Solid Waste Disposal and Resource Recovery (County)**
E&S	**Erosion and Sediment**
E/RRF	**Energy/Resource Recovery Facility**
ECC	**Environmental Coordinating Committee (County)**
EFID	**Environmental and Facilities Inspection Division (County)**
EFRD	**Environmental and Facilities Review Division (County)**
EHD	**Epizootic hemorrhagic disease**
EIS	**Environmental Impact Statement**
EPA	**Environmental Protection Agency (Federal)**
EPCRA	**Emergency Planning and Community Right-to-Know Act (Federal)**
EQAC	**Environmental Quality Advisory Council (County)**
EQC	**Environmental Quality Corridor**
ERIC	**Ecological Resources Inventory Committee (County)**
ESWTR	**Enhanced Surface Water Treatment Rule**
FAA	**Federal Aviation Administration**
FC	**Fecal Coliform**
FCPA	**Fairfax County Park Authority**
FCPS	**Fairfax County Public Schools**
FCWA	**Fairfax County Water Authority**
FJLEPC	**Fairfax Joint Local Emergency Planning Committee (Regional)**
FY	**Fiscal Year**
GAC	**Granular Activated Carbon**
GAT	**Guaranteed Annual Tonnage**
GIS	**Geographic Information System**
GMP	**General Management Plan**
GPS	**Groundwater Protection Standards**
HAA	**Haloacetic Acid**
HAZMAT	**Hazardous Materials**
HB	**House Bill (State)**
HHW	**Household Hazardous Waste**
HMERP	**Hazardous Material Emergency Response Plan**
HOV	**High Occupancy Vehicle**
HPO	**High Performance Organization**
IBI	**Index of Biotic Integrity**
ICPRB	**Interstate Commission on the Potomac River**

	Basin (Regional)
IESNA	**Illuminating Engineering Society of North America**
LCAT	**Lorton Citizens Alliance Team**
LEPC	**Local Emergency Planning Committee**
MCL	**Maximum Contaminant Level**
MCS	**Michigan Cogeneration Systems**
mg	**Million gallons**
mg/l	**Milligrams per liter**
mgd	**Million gallons per day**
ml	**Milliliter**
MOU	**Memorandum of Understanding**
MPO	**Metropolitan Planning Organization**
MRDL	**Maximum Residual Disinfectant Level**
MRF	**Material Recovery Facility**
MS4	**Municipal Separate Storm Sewer System**
MSW	**Municipal Solid Waste**
MTBE	**Methyl teritary butyl ether**
MWAA	**Metropolitan Washington Airports Authority (Regional)**
MWAQC	**Metropolitan Washington Air Quality Committee (Regional)**
MWCOG	**Metropolitan Washington Council of Governments (Regional – also cited as COG)**
NAAQS	**National Ambient Air Quality Standards**
NAIOP	**National Association of Industrial and Office Properties**
NAVAID	**Navigational Aid**
NBII	**National Biological Information Infrastructure**
NCPCP	**Noman M. Cole, Jr. Pollution Control Plant (County)**
NDB	**Non-Directional Beacon**
NIOSH	**National Institute for Occupational Safety & Health**
NMOC	**Non-Methane Organic Compounds**
NOx	**Oxides of Nitrogen/Nitrogen Dioxide**
NPDES	**National Pollutant Discharge Elimination System**
NPS	**Nonpoint Source Pollution**
NRCS	**Natural Resources Conservation Service (Federal)**
NRMP	**Natural Resource Management Plan**
NTU	**Nephelometric Turbidity Units**
NVBIA	**Northern Virginia Building Industry Association**
NVCS	**National Vegetation Classification System**
NVCT	**Northern Virginia Conservation Trust**
NVPDC	**Northern Virginia Planning District Commission**
NVRC	**Northern Virginia Regional Commission**
NVRPA	**Northern Virginia Regional Park Authority**

NVSWCD	**Northern Virginia Soil and Water Conservation District (Regional)**
NVTA	**Northern Virginia Transportation Authority (Regional)**
NWR	**National Wildlife Refuge**
O_2	**Oxygen**
OBM	**Optical Brightener Monitoring**
OCF	**Office of Capital Facilities (County)**
OSDS	**Office of Site Development Services (County)**
OSHA	**Occupational Safety and Health Administration (Federal)**
OWML	**Occoquan Watershed Monitoring Laboratory**
PC	**Planning Commission (County)**
PERC	**Perchloroethylene**
PFM	**Public Facilities Manual (County)**
PPM	**parts per million**
PRM	**Principal Recyclable Material**
QA/QC	**Quality Assurance/Quality Control**
RACM	**Reasonably Available Control Measures**
RDOC	**Recycling Drop Off Centers**
ResWAG	**Reston Association Watershed Action Group**
ROD	**Record of Decision**
ROP	**Rate of Progress**
RPA	**Resource Protection Area**
SARA	**Superfund Amendments and Reauthorization Act of 1986 (Federal)**
SAV	**Submersed Aquatic Vegetation**
SB	**Senate Bill (State)**
SDWA	**Safe Drinking Water Act (Federal)**
SIP	**State Implementation Plan**
SMCL	**Secondary Maximum Contaminant Level**
SO_2	**Sulfur Dioxide**
SOC	**Synthetic Organic Compounds**
SPS	**Stream Protection Strategy**
STPP	**Surface Transportation Policy Project**
SUAG	**Stormwater Utility Advisory Group (County)**
SWCB	**State Water Control Board**
SWPD	**Stormwater Planning Division (County)**
SWRRC	**Solid Waste Reduction and Recycling Centers**
TAC	**Transportation Advisory Commission (County)**
TCC	**Transportation Coordinating Council (Regional)**
THM	**Trihalomethanes**
TMDL	**Total Daily Maximum Load**
TOD	**Transit Oriented Development**
TPB	**Threshold Planning Quantity**
TPB	**Transportation Planning Board (Regional)**

TRACON	**Terminal Radar Approach Control**
TTHM	**Total Trihalomethanes**
UFD	**Urban Forestry Division (County)**
µg/l	**Microgram Per Liter**
UOSA	**Upper Occoquan Sewage Authority**
UrBIN	**Urban Biodiversity Information Node**
USDA	**United States Department of Agriculture**
USGS	**United States Geological Survey**
VDEQ	**Virginia Department of Environmental Quality**
VDGIF	**Virginia Department of Game and Inland Fisheries**
VDH	**Virginia Department of Health**
VDOF	**Virginia Department of Forestry**
VDOT	**Virginia Department of Transportation**
VMT	**Vehicle Miles Traveled**
VOC	**Volatile Organic Compound**
VPDES	**Virginia Pollutant Discharge Elimination System**
WHO	**World Health Organization**
WID	**Watershed Improvement District**
WWTP	**Wastewater Treatment Plant**
YIMBY	**Yes In My Back Yard**